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GROUP 35C

ACTIVE STABILITY CONTROL SYSTEM (ASC)

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GENERAL

M1357000100028

Due to the adoption of the active stability control system (ASC), the service procedure has been added.
<M/T-vehicles>

SERVICE SPECIFICATIONS

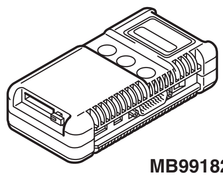
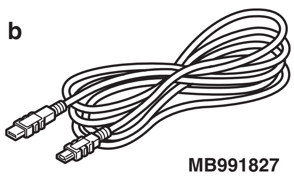
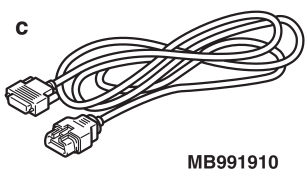
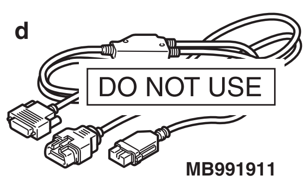
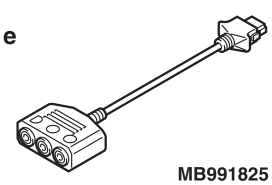
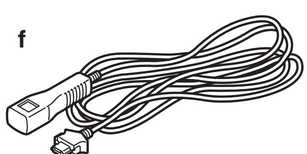
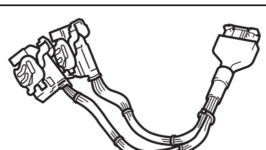
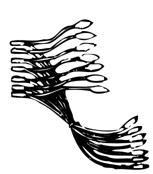
M1357003000019

Item	Standard value
Wheel speed sensor current mA	5.9 – 8.4
Wheel speed sensor insulation resistance MΩ	5 – 100

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SPECIAL TOOL

M1357000200014

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (for vehicles with CAN communication) d. M.U.T.-III main harness B (for vehicles without CAN communication) e. Measuring adapter harness f. M.U.T.-III trigger harness	ASC check (DTCs display, service data display and calibration by M.U.T.-III) ⚠ CAUTION **For vehicles with CAN communication, use the M.U.T.-III main harness A to send the simulated vehicle speed. If you connect the M.U.T.-III main harness B instead, the CAN communication does not function correctly.**
 MB991984	MB991984	ABS check harness	Voltage inspection at ASC-ECU terminals
	MB991709	Wiring harness set	Output voltage inspection at G and yaw rate sensor

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TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1357000400018

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-5.

PRECAUTIONS FOR DIAGNOSIS

M1357000500015

1. ABS/ASC controls brake pressure by the assistance of ECU. The symptoms described in the chart below may occur during the normal ABS/ASC operation, and they do not indicate any sign of malfunction.

Symptoms	Description of symptoms
• When the ABS hydraulic unit operates, the operating noise is generated from the motor. (Squeak noise) • Noise is generated from the brake pedal together with the vibration. (Gride noise) • When ABS operates, the system repeats the activation and deactivation. At this time, the noise is generated from the chassis components. (Clonk: Suspension, Squeaky: Tyres)	These noises are generated when the system and brake pedal operate normally, and they do not indicate any sign of malfunction.
• A slight shock may be felt when depressing the brake pedal lightly during the low speed driving. • Small clicking noise may be heard from the engine compartment.	This noise is generated when the system operation check (startup check performed at the vehicle speed which is a few km/h higher than the predetermined vehicle speed) is performed, and it does not indicate malfunction.

2. On the snowy or gravelled roads, a vehicle with ABS would have longer braking distance compared to the one without ABS. Considering this characteristics, advise the customer to drive the vehicle safely at lower speed and not to put too much confidence in the ABS system when driving on the above-mentioned roads.
3. The diagnosis code detection condition depends on each diagnosis code. When the trouble symptoms are rechecked, conditions described in the description for the diagnosis code procedures should be met.

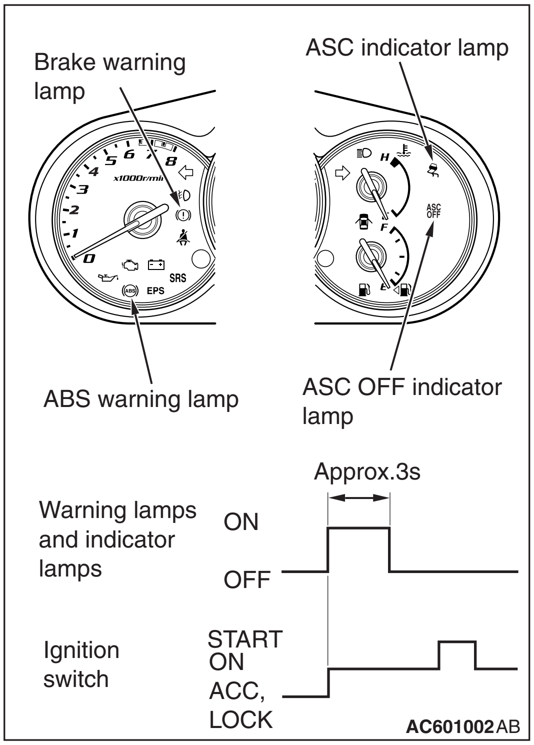
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INSPECTION OF ASC INDICATOR LAMP, ASC OFF INDICATOR LAMP, ABS WARNING LAMP AND BRAKE WARNING LAMP

M1357000600012

Check that the ASC indicator lamp, ASC OFF indicator lamp, ABS warning lamp, and brake warning lamp illuminate as follows.

NOTE: The EBD warning lamp is also used as the brake warning lamp.



1. When the ignition switch is turned ON, the ASC indicator lamp, ASC OFF indicator lamp, ABS warning lamp, and brake warning lamp illuminate.
2. The ASC indicator lamp, ASC OFF indicator lamp, ABS warning lamp, and brake warning lamp illuminate for three seconds *1 and then extinguishes *2.
3. Otherwise, check the diagnosis code.

NOTE:

- **1: The ABS warning lamp may illuminate until the vehicle speed reaches 10 km/h. As far as ASC-ECU stores any diagnosis code related to the wheel speed sensor malfunction or the motor malfunction as past trouble, ASC-ECU continues illuminating the ABS warning lamp until it verifies that the malfunction for that code is resolved (start-up check).*
- **2: The lamp does not turn OFF when the parking brake is applied or the brake fluid level is lowered.*

DIAGNOSTIC FUNCTION

M1357000700019

HOW TO READ DIAGNOSIS CODE

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-7.

HOW TO ERASE DIAGNOSIS CODE

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-7.

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DIAGNOSIS CODE CHART

M1357000800016

⚠ **CAUTION**

During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Diagnosis code No.	Item	Reference page
C1200	Wheel speed sensor (FR) system (open circuit or short to earth or power supply)	P.35C-8
C1205	Wheel speed sensor (FL) system (open circuit or short to earth or power supply)	
C1210	Wheel speed sensor (RR) system (open circuit or short to earth or power supply)	
C1215	Wheel speed sensor (RL) system (open circuit or short to earth or power supply)	
C1201	Wheel speed sensor (FR) system (sensor output error)	P.35C-19
C1206	Wheel speed sensor (FL) system (sensor output error)	
C1211	Wheel speed sensor (RR) system (sensor output error)	
C1216	Wheel speed sensor (RL) system (sensor output error)	
C1222	Wheel speed sensor system (abnormal power supply voltage)	P.35C-30
C1225	Wheel speed sensor system (sensor output error)	P.35C-35
C1226	Control solenoid valve (FR) pressure holding system	P.35C-45
C1231	Control solenoid valve (FR) decompressing system	
C1236	Control solenoid valve (FL) pressure holding system	
C1241	Control solenoid valve (FL) pressure reducing system	
C1246	Control solenoid valve (RR) pressure holding system	
C1251	Control solenoid valve (RR) pressure reducing system	
C1256	Control solenoid valve (RL) pressure holding system	
C1261	Control solenoid valve (RL) decompressing system	
C1266	Motor system (seizure)	P.35C-46
C1273	Motor relay stuck OFF	
C1274	Motor relay stuck ON	
C1276	Valve relay system	P.35C-50
C1278	Valve relay system stuck off	P.35C-53
C1279	Valve relay system stuck on	P.35C-55
C1300	Cut valve (FR/RL) <primary> system	P.35C-45
C1305	Suction valve (FR/RL) <primary> system	
C1310	Cut valve (FL/RR) <secondary> system	
C1315	Suction valve (FL/RR) <secondary> system	
C1340	Stop lamp switch signal error	P.35C-57
C1345	Low brake fluid level	P.35C-60
C1364	Internal malfunction of pressure sensor	P.35C-62

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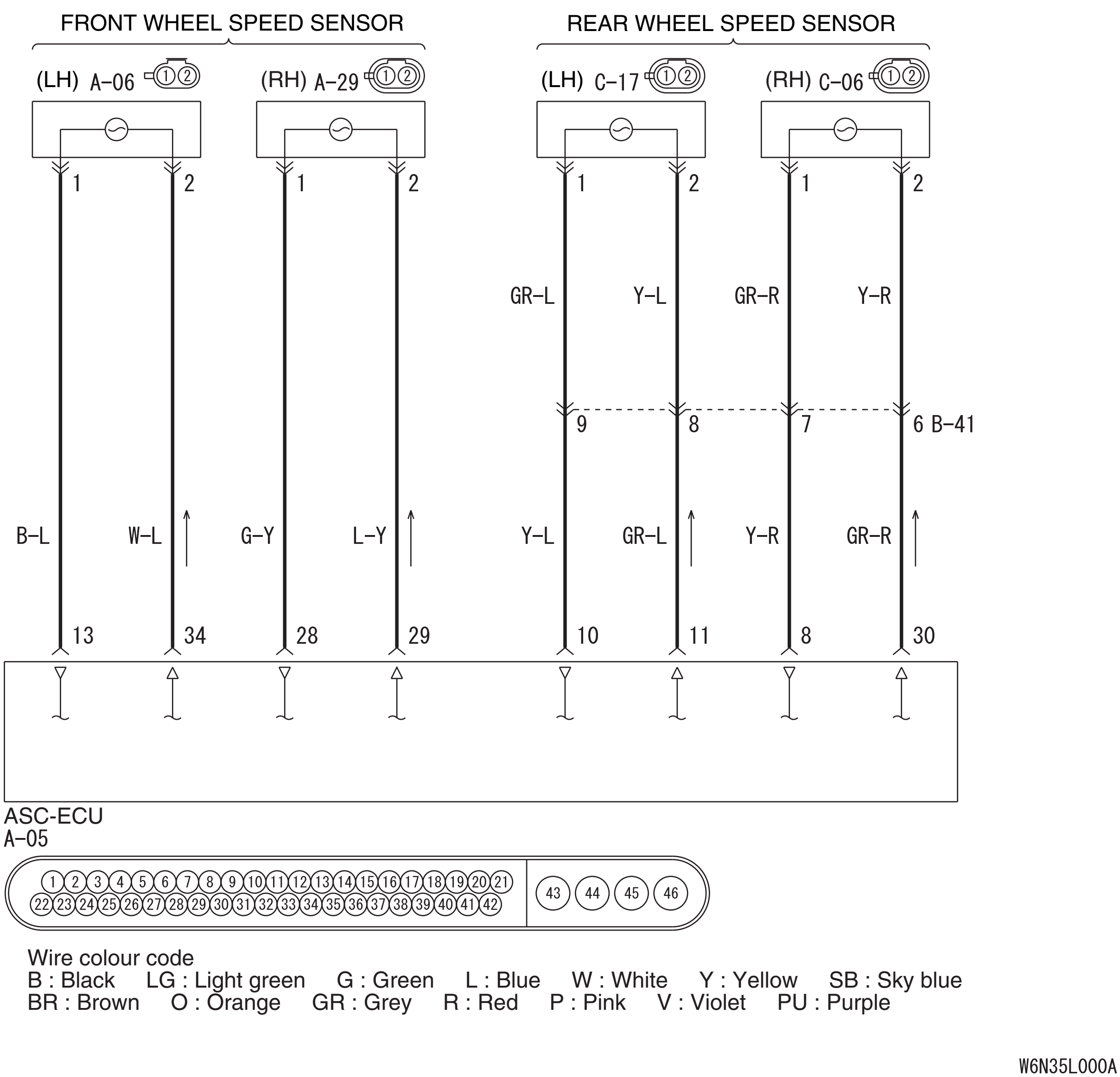
Diagnosis code No.	Item	Reference page
C1366	Lateral G-sensor signal error	P.35C-62
C1371	Yaw rate sensor signal error	P.35C-63
C1385	Yaw rate sensor error	P.35C-64
C1387	Lateral G-sensor error	P.35C-65
C1388	Yaw rate sensor active check error	P.35C-66
C1394	Steering wheel sensor neutral point not learned	P.35C-67
C1396	Engine torque intervention rejection	P.35C-67
C1505	Steering wheel sensor error	P.35C-68
C1555	Range exceeding of steering wheel sensor	P.35C-69
C1607	Malfunction of ASC-ECU	P.35C-69
C1621	G and yaw rate sensor improper installation	P.35C-70
C1860	Abnormal rise of ASC-ECU power supply voltage	P.35C-71
C1861	Abnormal drop of ASC-ECU power supply voltage	P.35C-72
C1862	Abnormal power supply voltage of G and yaw rate sensor (high voltage)	P.35C-75
C1863	Abnormal power supply voltage of G and yaw rate sensor (low voltage)	P.35C-76
U1073	Bus-off	P.35C-79
U1100	Engine-related CAN time-out error	P.35C-79
U1104	Steering wheel sensor CAN time-out error	P.35C-80
U1105	G and yaw rate sensor CAN time-out error	P.35C-81
U1406	Accelerator pedal position signal error	P.35C-82
U1426	Engine speed signal error	P.35C-83
U1427	Engine torque signal error	P.35C-84
U1428	Engine's maximum torque signal error	
U1429	Engine's minimum torque signal error	
U1430	Engine torque request signal error	

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DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No. C1200: Wheel speed sensor (FR) system (open circuit or short to earth or power supply)
Code No. C1205: Wheel speed sensor (FL) system (open circuit or short to earth or power supply)
Code No. C1210: Wheel speed sensor (RR) system (open circuit or short to earth or power supply)
Code No. C1215 Wheel speed sensor (RL) system (open circuit or short to earth or power supply)

Wheel Speed Sensor Circuit



⚠ **CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

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OPERATION

- The wheel speed sensor is a kind of a pulse generator. It consists of magnetic encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects short or open circuit in the circuit, it will set a diagnosis code.

PROBABLE CAUSES

Current trouble

- Damaged wiring harness and connectors
- Malfunction of the wheel speed sensor
- ASC-ECU malfunction

Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1200, C1205, C1210 or C1215 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III data list

Check the following service data. (Refer to P.35B-72.)

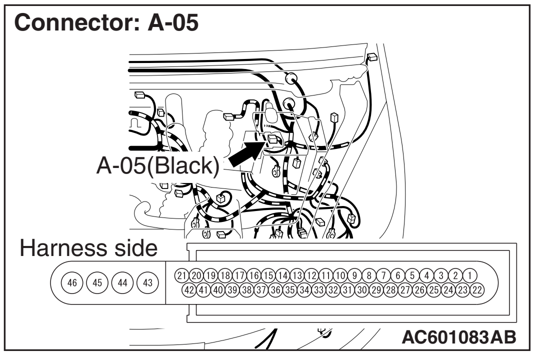
- (When the code No. C1200 is set) Item 01: FR wheel speed sensor
- (When the code No. 1205 is set) Item 02: FL wheel speed sensor
- (When the code No. 1210 is set) Item 03: RR wheel speed sensor
- (When the code No. C1215 is set) Item 04: RL wheel speed sensor

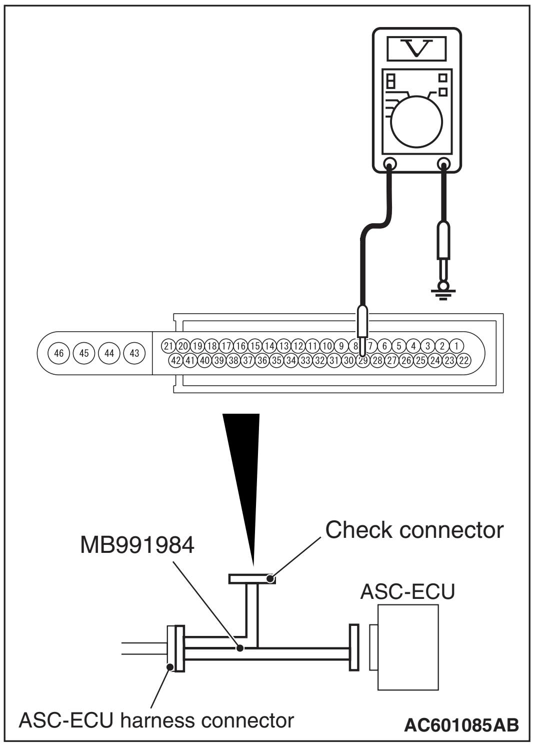
Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)
NO : Go to Step 4.

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STEP 4. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: . Do not connect the special tool to ASC-ECU.

(2) Ignition switch: ON

(3) Measure the voltage between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

Diagnosis code No.	Checking terminal	
	Power supply terminal	Signal terminal
C1200	No. 29	No. 28
C1205	No. 34	No. 13
C1210	No. 30	No. 8
C1215	No. 11	No. 10

OK: 0 V

Q: Is the check result normal?

YES : Go to Step 5.

NO (Not normal at the terminal No. 29 or 28) : Go to Step 6.

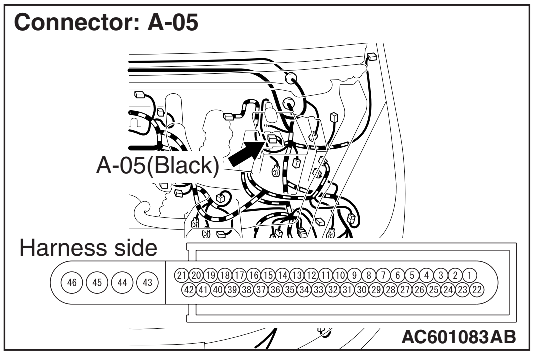
NO (Not normal at the terminal No. 34 or 13) : Go to Step 8.

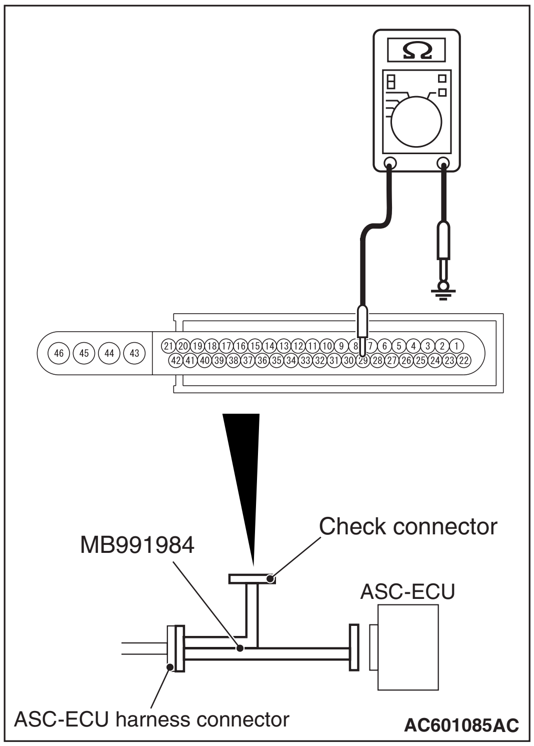
NO (Not normal at the terminal No. 30 or 8) : Go to Step 10.

NO (Not normal at the terminal No. 11 or 10) : Go to Step 12.

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STEP 5. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

Diagnosis code No.	Checking terminal	
	Power supply terminal	Signal terminal
C1200	No. 29	No. 28
C1205	No. 34	No. 13
C1210	No. 30	No. 8
C1215	No. 11	No. 10

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 14.

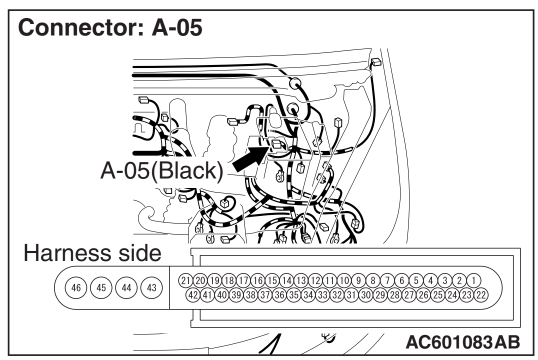
NO (Not normal at the terminal No. 29 or 28) : Go to Step 6.

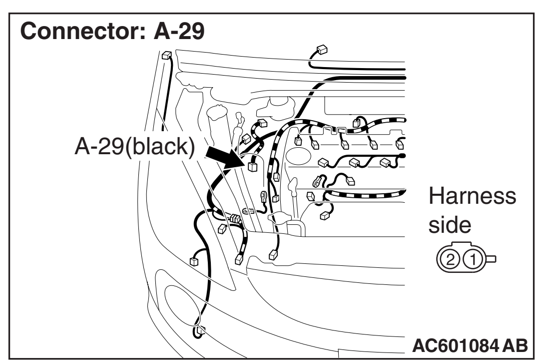
NO (Not normal at the terminal No. 34 or 13) : Go to Step 8.

NO (Not normal at the terminal No. 30 or 8) : Go to Step 10.

NO (Not normal at the terminal No. 11 or 10) : Go to Step 12.

STEP 6. Connector check: A-05 ASC-ECU connector, A-29 wheel speed sensor <FR> connector



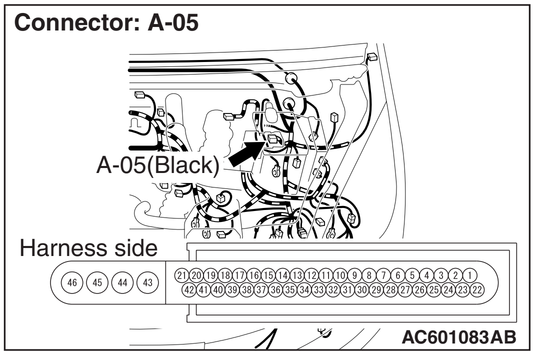


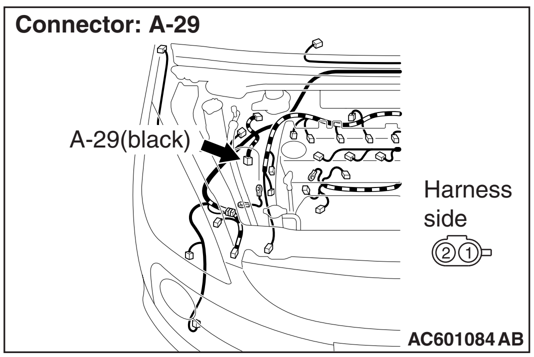
Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the damaged connector.

STEP 7. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 29, 28 and A-29 wheel speed sensor <FR> connector terminal No. 2, 1.



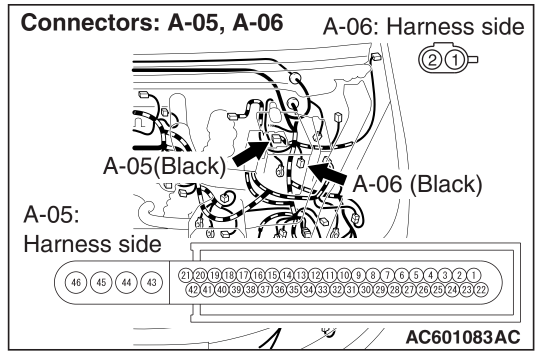


Check for short circuit in the wheel speed sensor <FR> circuit

Q: Is the check result normal?

YES : Replace the wheel speed sensor <FR>.
NO : Repair the wiring harness.

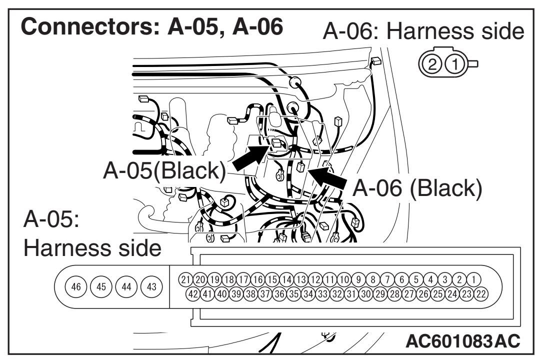
STEP 8. Connector check: A-05 ASC-ECU connector, A-06 wheel speed sensor <FL> connector



Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the damaged connector.

STEP 9. Check the harness wire between A-05 ASC-ECU connector terminal No. 34, 13 and A-06 wheel speed sensor <FL> connector terminal No. 2, 1.



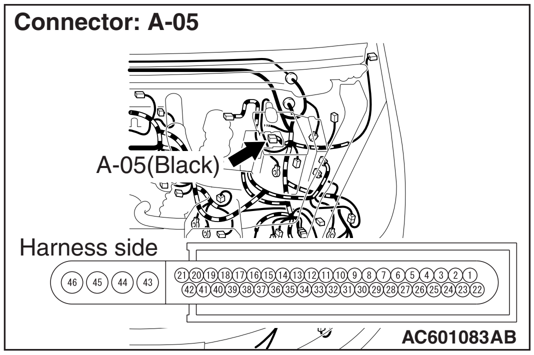
Check for short circuit in wheel speed sensor <FL> circuit.

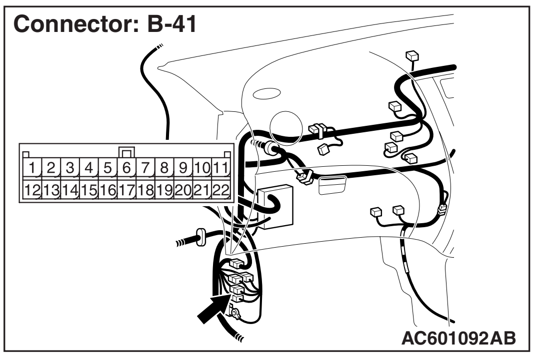
Q: Is the check result normal?

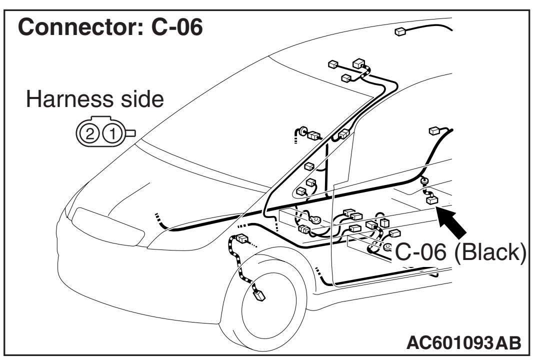
YES : Replace the wheel speed sensor <FL>.
NO : Repair the wiring harness.

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STEP 10. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-06 wheel speed sensor <RR> connector



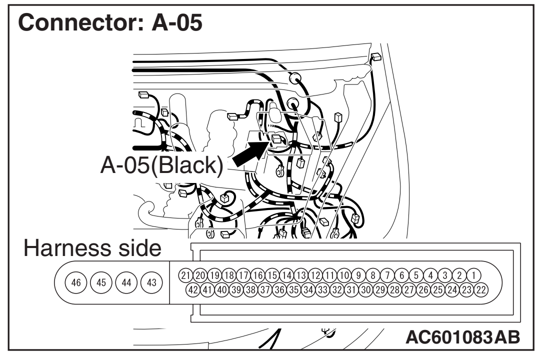


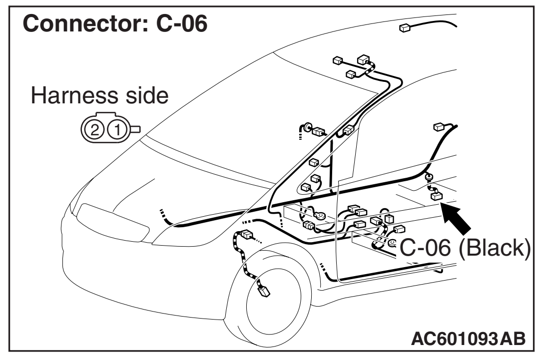


Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the damaged connector.

STEP 11. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 30, 8 and C-06 wheel speed sensor <RR> connector terminal No. 2, 1.





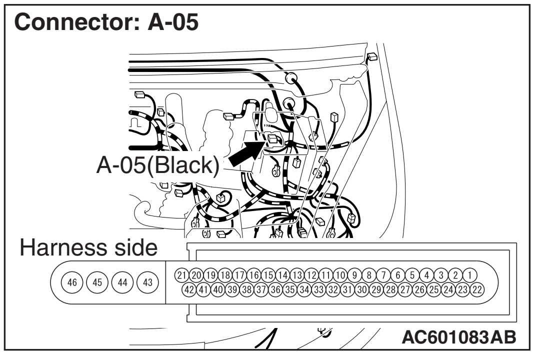
Check for short circuit in wheel speed sensor <RR> circuit.

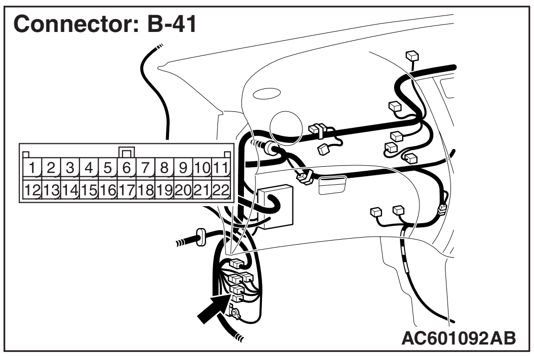
Q: Is the check result normal?

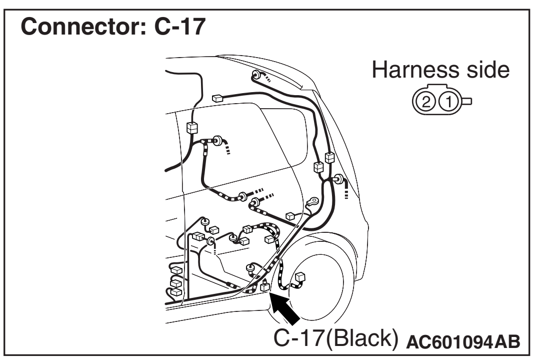
YES : Replace the wheel speed sensor <RR>.
NO : Repair the wiring harness.

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STEP 12. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-17 wheel speed sensor <RL> connector



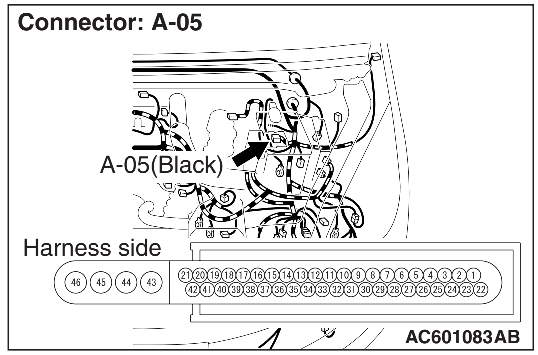


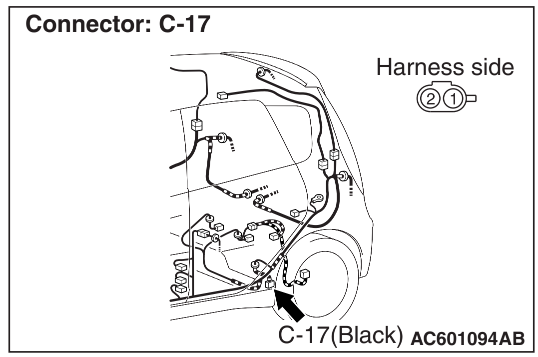


Q: Is the check result normal?

YES : Go to Step 13.
NO : Repair the damaged connector.

STEP 13. Wiring harness check: between A-05 ASC-ECU connector terminal No. 11, 10 and C-17 wheel speed sensor <RL> connector terminal No. 2, 1.



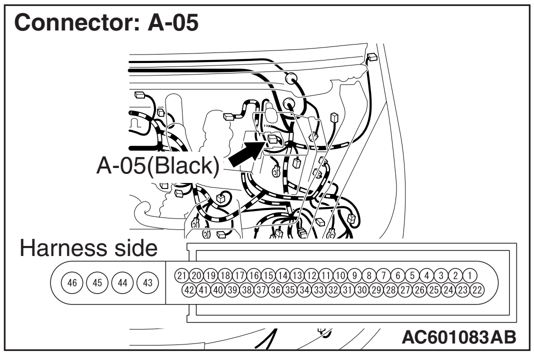


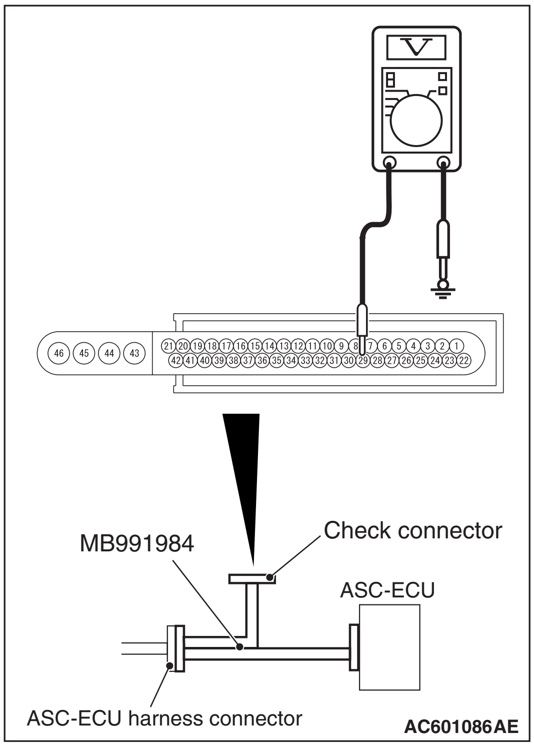
Check for short circuit in wheel speed sensor <RL> circuit.

Q: Is the check result normal?

YES : Replace the wheel speed sensor <RL>.
NO : Repair the wiring harness.

STEP 14. Voltage measurement: A-05 ASC-ECU connector





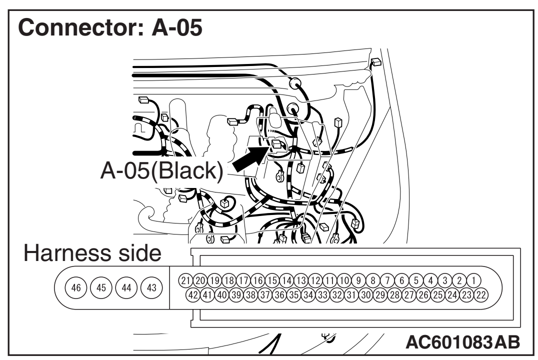
(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the ASC-ECU side connector and harness-side connector, and then measure the voltage at the special tool connector side.
(2) Ignition switch: ON
(3) Measure the voltage between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

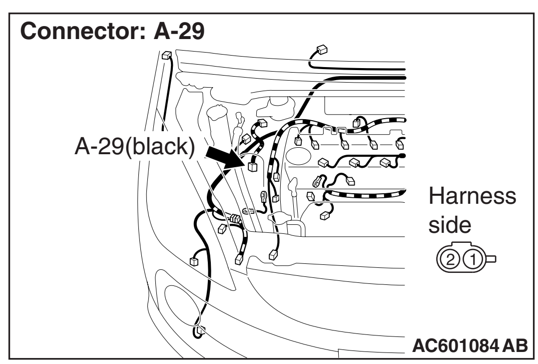
Diagnosis code No.	Checking terminal	
	Power supply terminal	Signal terminal
C1200	No. 29	No. 28
C1205	No. 34	No. 13
C1210	No. 30	No. 8
C1215	No. 11	No. 10

OK:
<Power supply terminal> Approximately 12 V
<Signal terminal> 0.4 to 1.3 V

Q: Is the check result normal?
YES : Go to Step 24.
NO (Not normal at the terminal No. 29 or 28) : Go to Step 15.
NO (Not normal at the terminal No. 34 or 13) : Go to Step 17.
NO (Not normal at the terminal No. 30 or 8) : Go to Step 19.
NO (Not normal at the terminal No. 11 or 10) : Go to Step 21.

STEP 15. Connector check: A-05 ASC-ECU connector, A-29 wheel speed sensor <FR> connector

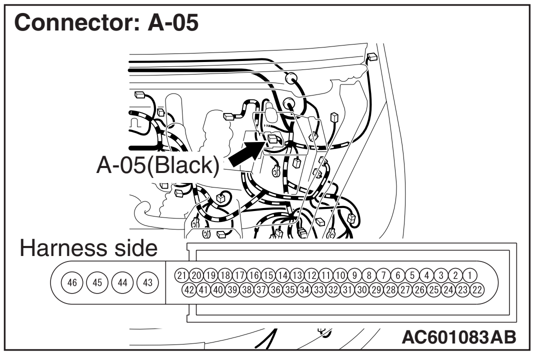


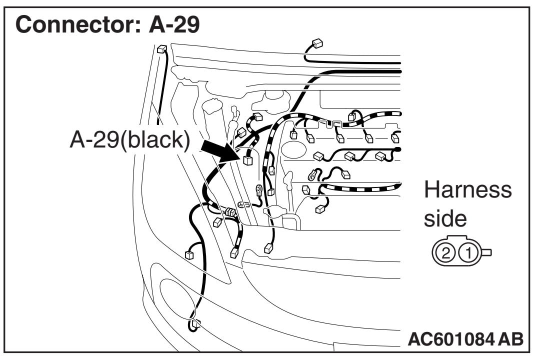


Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the damaged connector.

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STEP 16. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 29, 28 and A-29 wheel speed sensor <FR> connector terminal No. 2, 1.



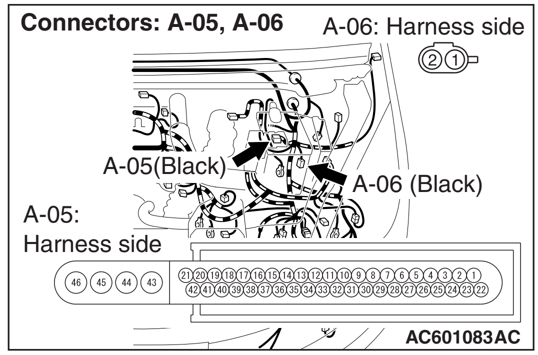


Check for open circuit in wheel speed sensor <FR> circuit.

Q: Is the check result normal?

YES : Go to Step 23.
NO : Repair the wiring harness.

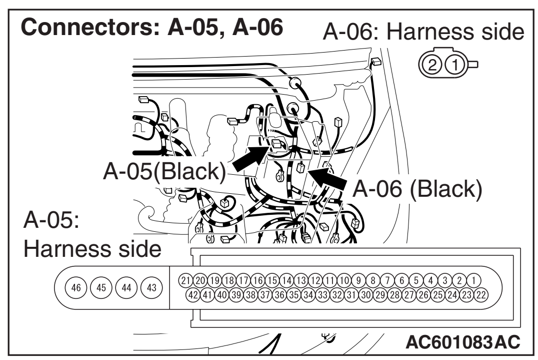
STEP 17. Connector check: A-05 ASC-ECU connector, A-06 wheel speed sensor <FL> connector



Q: Is the check result normal?

YES : Go to Step 18.
NO : Repair the damaged connector.

STEP 18. Check the harness wire between A-05 ASC-ECU connector terminal No. 34, 13 and A-06 wheel speed sensor <FL> connector terminal No. 2, 1.



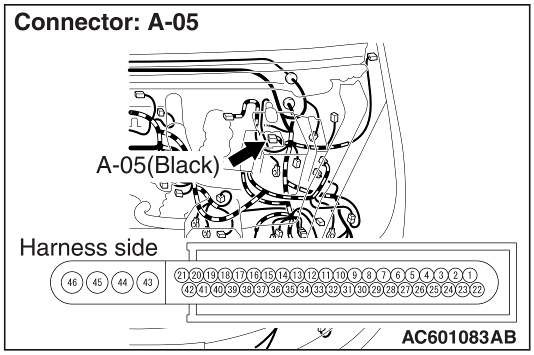
Check for open circuit in wheel speed sensor <FL> circuit.

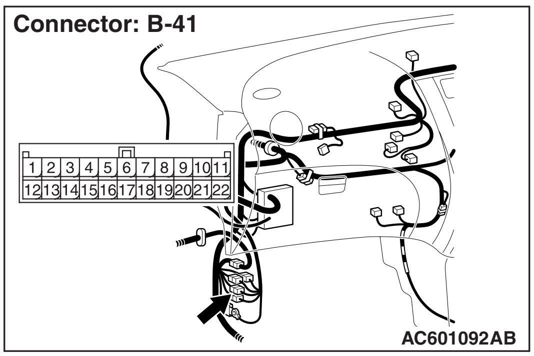
Q: Is the check result normal?

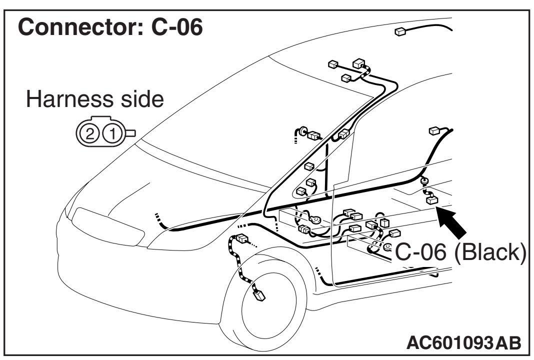
YES : Go to Step 23.
NO : Repair the wiring harness.

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STEP 19. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-06 wheel speed sensor <RR> connector





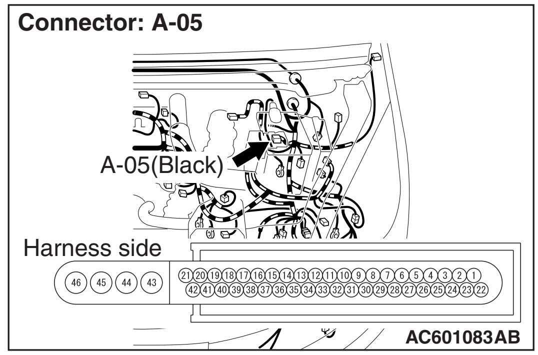


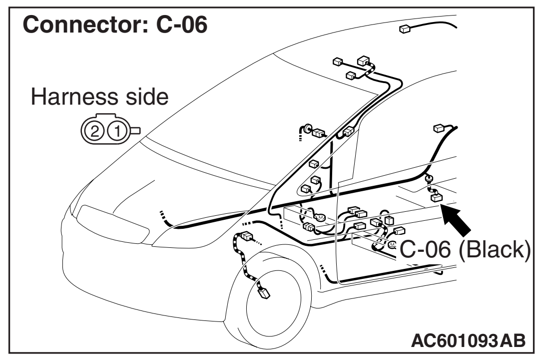
Q: Is the check result normal?

YES : Go to Step 20.

NO : Repair the damaged connector.

STEP 20. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 30, 8 and C-06 wheel speed sensor <RR> connector terminal No. 2, 1.





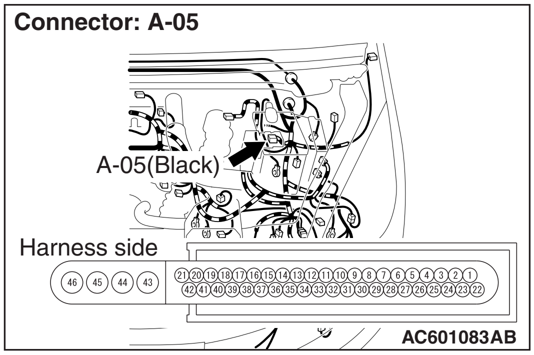
Q: Is the check result normal?

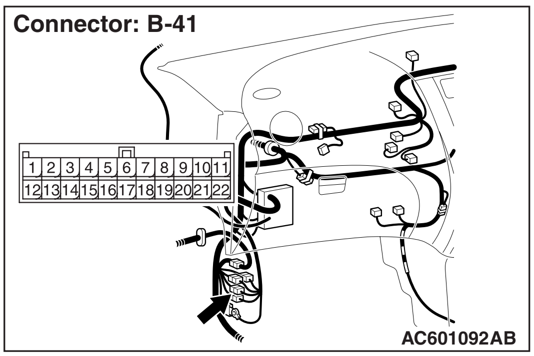
YES : Go to Step 23.

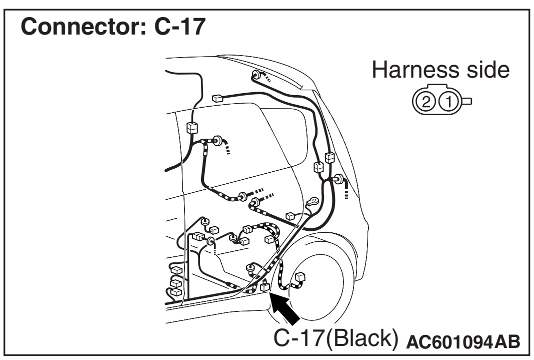
NO : Repair the wiring harness.

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STEP 21. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-17 wheel speed sensor <RL> connector

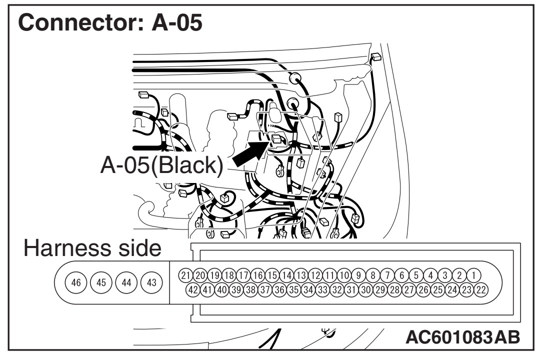


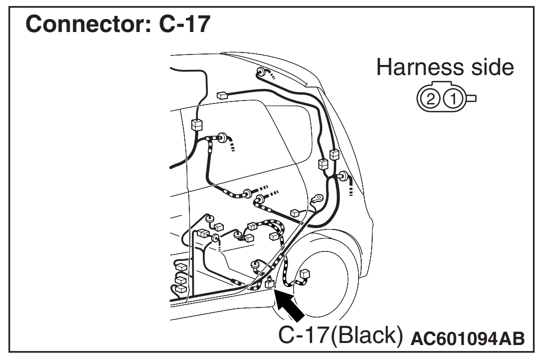




Q: Is the check result normal?
YES : Go to Step 22.
NO : Repair the damaged connector.

STEP 22. Wiring harness check: between A-05 ASC-ECU connector terminal No. 11, 10 and C-17 wheel speed sensor <RL> connector terminal No. 2, 1.





Check for short circuit in wheel speed sensor <RL> circuit.

Q: Is the check result normal?
YES : Go to Step 23.
NO : Repair the wiring harness.

STEP 23. Check for wheel speed sensor as a single unit

Refer to P.35B-81.

Q: Is the check result normal?
YES : Go to Step 24.
NO : Replace the wheel speed sensor.

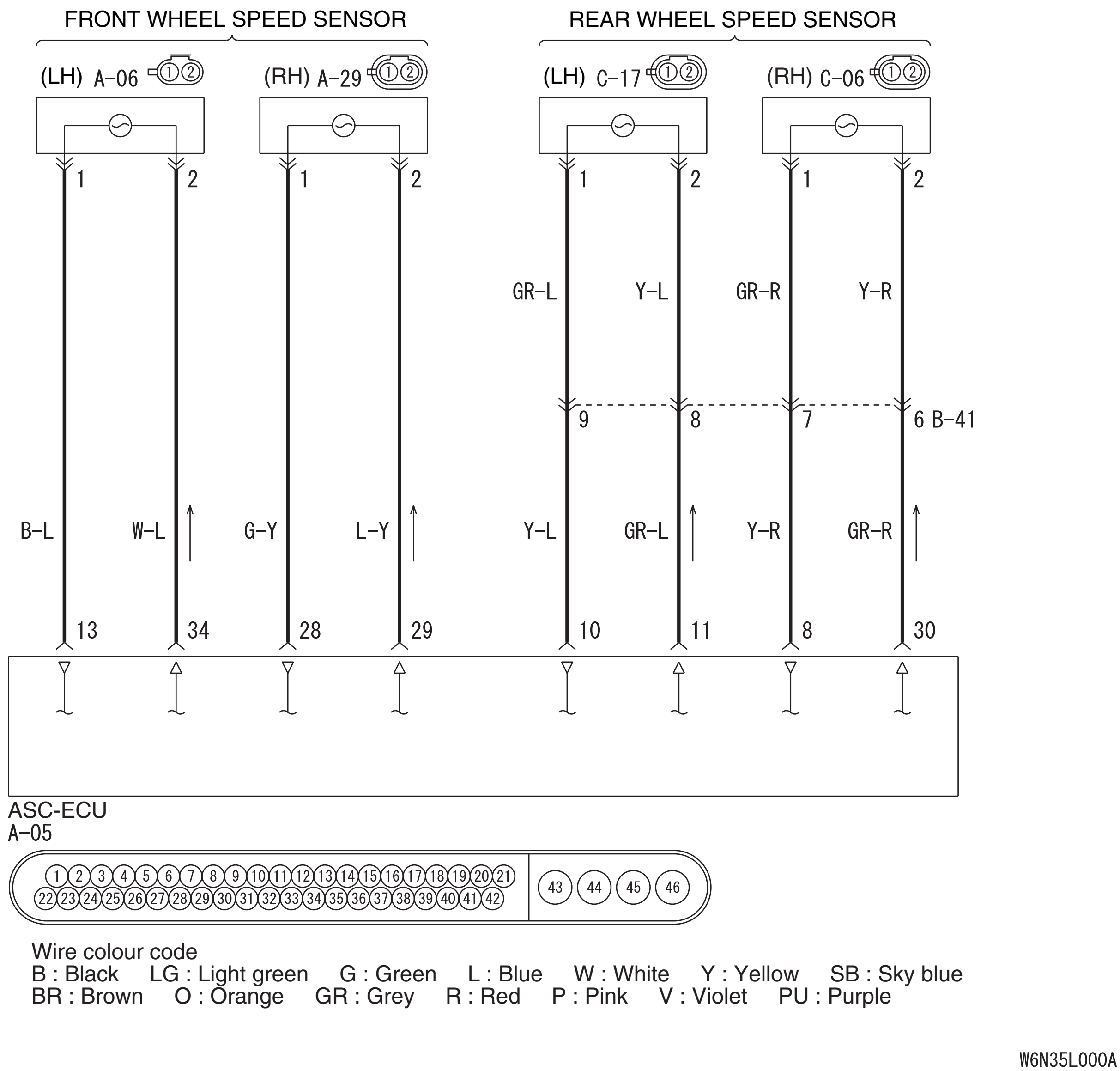
STEP 24. Diagnosis code recheck

Q: Is the diagnosis code No. C1200, C1205, C1210 or C1215 set?
YES : Replace the ASC-ECU.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. C1201: wheel speed sensor (FR) system (sensor output error)
Code No. C1206: wheel speed sensor (FL) system (sensor output error)
Code No. C1211: wheel speed sensor (RR) system (sensor output error)
Code No. C1216: wheel speed sensor (RL) system (sensor output error)

Wheel Speed Sensor Circuit



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

- The wheel speed sensor is a kind of a pulse generator. It consists of magnetic encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

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DIAGNOSIS CODE SET CONDITIONS

The ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any faults below is found in these sensor signals, the ECU will set the relevant diagnosis code.

- Missing sensor signal
- Sensor signal, which will not be created under normal operation
- Significant difference among the wheel speed sensor signals

PROBABLE CAUSES

Current trouble

- Improper installation of the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection magnetic encoder
- Deformation of the wheel speed detection magnetic encoder
- Excessive gap between the wheel speed sensor and the wheel speed detection magnetic encoder
- Damaged wiring harness and connectors
- Malfunction of the wheel speed sensor
- ASC-ECU malfunction

Past trouble

- When the diagnosis code No. C1200, C1205, C1210 or C1215 is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13).
- When the diagnosis code No. C1200, C1205, C1210, or C1215 is not set, the following conditions may be present:
  - Right or/and left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C1201, C1206, C1211 or C1216 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code

Check that the diagnosis codes No. C1200, C1205, C1210, and C1215 are also set.

Q: Are the diagnosis codes No. C1200, C1205, C1210 and C1215 also set?

YES : Perform the diagnosis for the diagnosis code No. C1200, C1205, C1210, and C1215. (Refer to P.35C-8.)
NO : Go to Step 4.

STEP 4. Wheel speed sensor installation state check

Check the installation state (sensor disconnection, loose mounting bolts, etc.) of the wheel speed sensor indicated by the diagnosis code No.

Diagnosis code No.	Relevant sensor
C1201	Front right
C1206	Front left
C1211	Rear right
C1216	Rear left

Q: Is the check result normal?

YES : Go to Step 5.
NO : Reinstall the wheel speed sensor correctly.

STEP 5. Check for wheel speed sensor as a single unit

Refer to P.35B-81.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the wheel speed sensor.

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STEP 6. Check for wheel bearing looseness

NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing indicated by the code No. for looseness.

Diagnosis code No.	Relevant sensor
C1201	Front right
C1206	Front left
C1211	Rear right
C1216	Rear left

- Front: Refer to GROUP 26 – On-vehicle Service P.26-5.
- Rear: Refer to GROUP 27A – On-vehicle Service P.27-3.

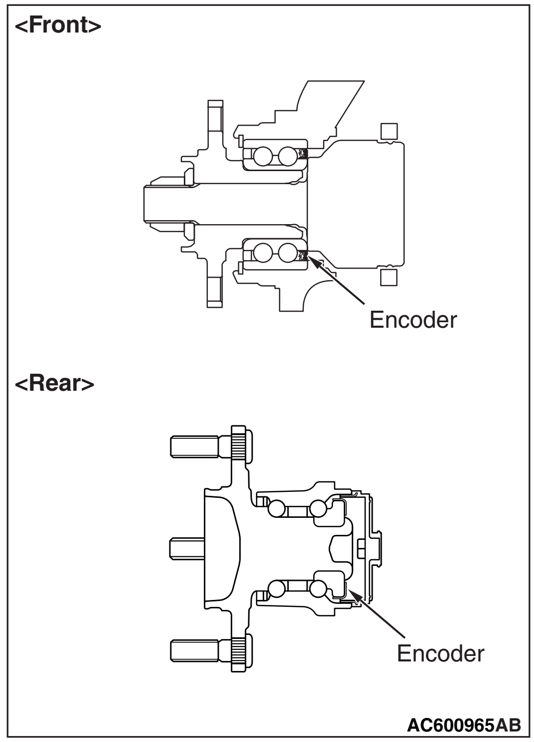
Q: Is the check result normal?

YES : Go to Step 7.

NO <when the relevant wheel is front> : Replace the wheel bearing. (Refer to GROUP 26 – Front Axle Hub P.26-13.)

NO <when the relevant wheel is rear> : Replace the rear hub assembly. (Refer to GROUP 27A – Rear Axle Hub P.27-6.)

STEP 7. Wheel speed detection magnetic encoder check



Check the wheel speed detection magnetic encoder for adhesion of foreign materials or deformation.

NOTE: For the rear wheel speed detection magnetic encoder, check from the mounting hole of the wheel speed sensor by rotating the rear hub.

Q: Is the check result normal?

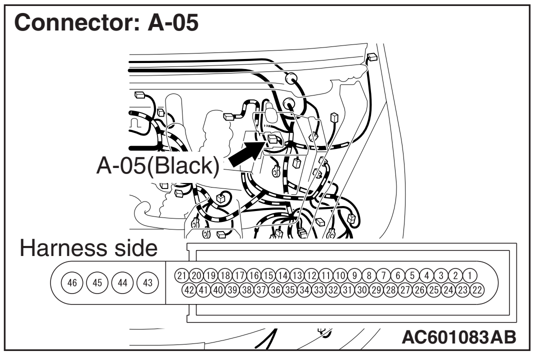
YES : Go to Step 8.

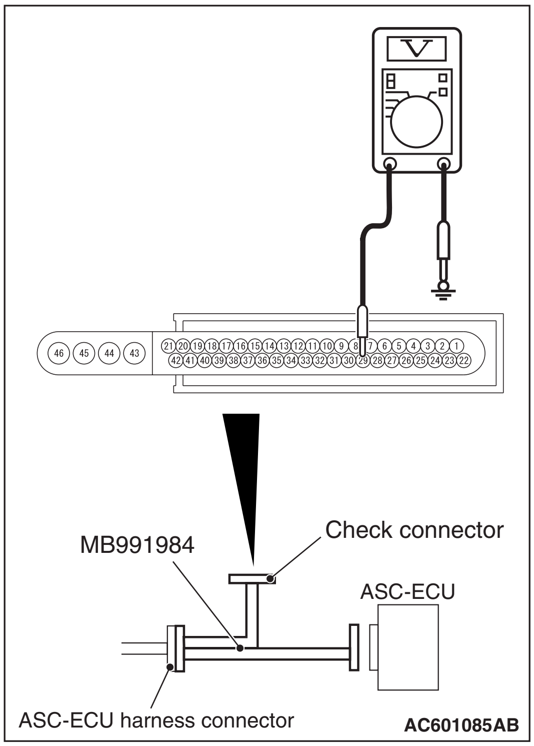
NO <when the relevant wheel is front> : When a foreign material adheres to the encoder, clean it. When the encoder is deformed, replace the wheel bearing. (Refer to GROUP 26 – Front Axle Hub P.26-13.)

NO <when the relevant wheel is rear> : When a foreign material adheres to the encoder, clean it. When the encoder is deformed, replace the rear hub assembly. (Refer to GROUP 27A – Rear Axle Hub P.27-6.)

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STEP 8. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: . Do not connect the special tool to ASC-ECU.

(2) Ignition switch: ON

(3) Measure the voltage between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

Diagnosis code No.	**Checking terminal**	
	Power supply terminal	**Signal terminal**
C1201	No. 29	No. 28
C1206	No. 34	No. 13
C1211	No. 30	No. 8
C1216	No. 11	No. 10

OK: 0 V

Q: Is the check result normal?

YES : Go to Step 9.

NO (Not normal at the terminal No. 29 or 28) : Go to Step 10.

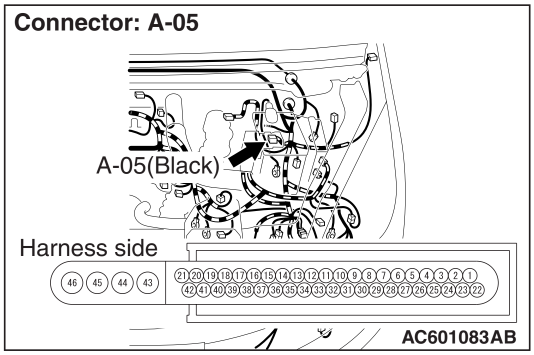
NO (Not normal at the terminal No. 34 or 13) : Go to Step 11.

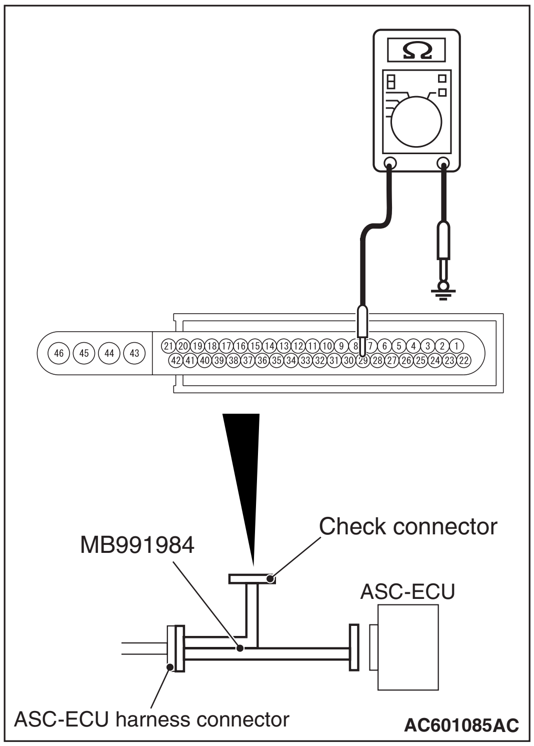
NO (Not normal at the terminal No. 30 or 8) : Go to Step 12.

NO (Not normal at the terminal No. 11 or 10) : Go to Step 13.

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STEP 9. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

Diagnosis code No.	Checking terminal	
	Power supply terminal	Signal terminal
C1201	No. 29	No. 28
C1206	No. 34	No. 13
C1211	No. 30	No. 8
C1216	No. 11	No. 10

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 14.

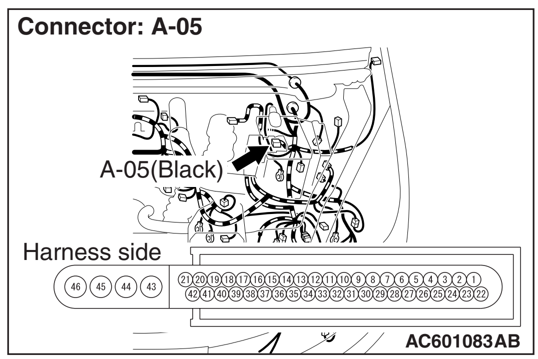
NO (Not normal at the terminal No. 29 or 28) : Go to Step 10.

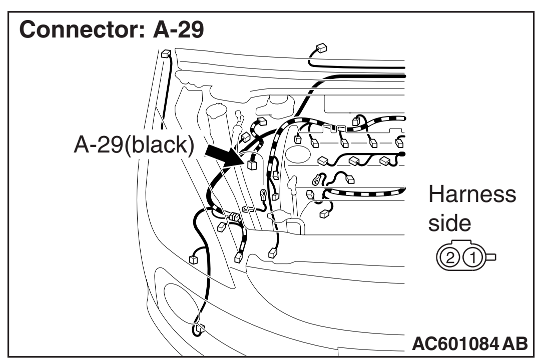
NO (Not normal at the terminal No. 34 or 13) : Go to Step 11.

NO (Not normal at the terminal No. 30 or 8) : Go to Step 12.

NO (Not normal at the terminal No. 11 or 10) : Go to Step 13.

STEP 10. Connector check: A-05 ASC-ECU connector, A-29 wheel speed sensor <FR> connector





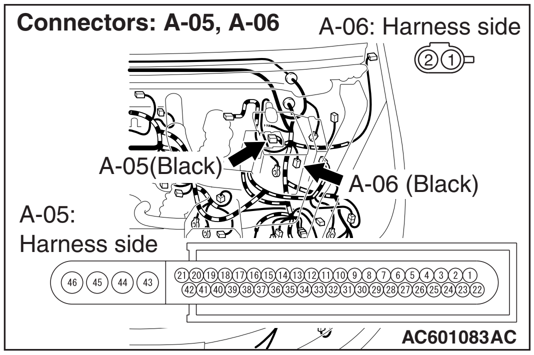
Q: Is the check result normal?

YES : Go to Step 16.

NO : Repair the damaged connector.

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STEP 11. Connector check: A-05 ASC-ECU connector, A-06 wheel speed sensor <FL> connector

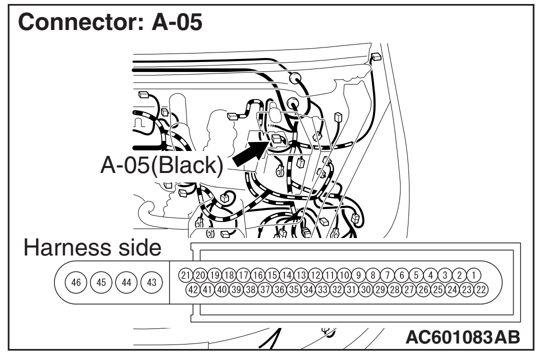


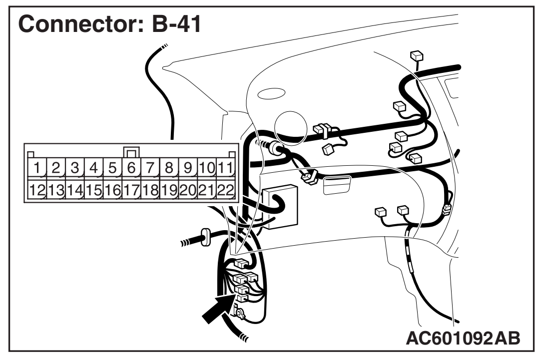
Q: Is the check result normal?

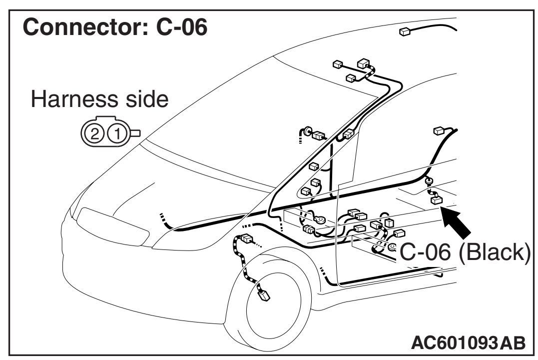
YES : Go to Step 18.

NO : Repair the damaged connector.

STEP 12. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-06 wheel speed sensor <RR> connector







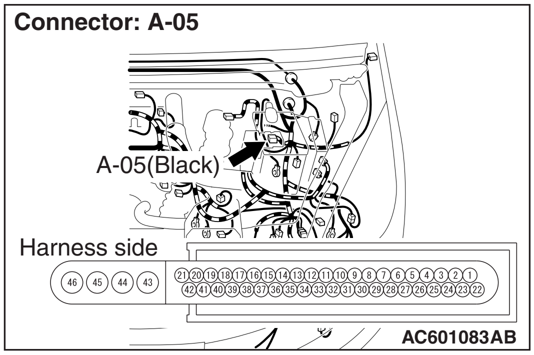
Q: Is the check result normal?

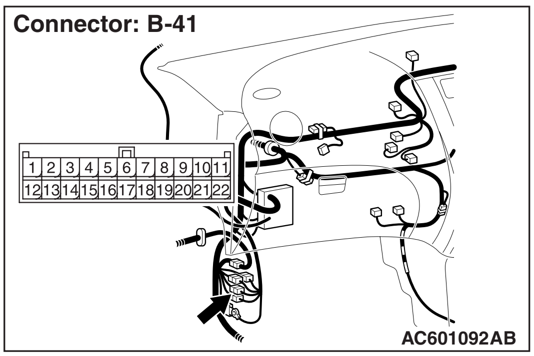
YES : Go to Step 20.

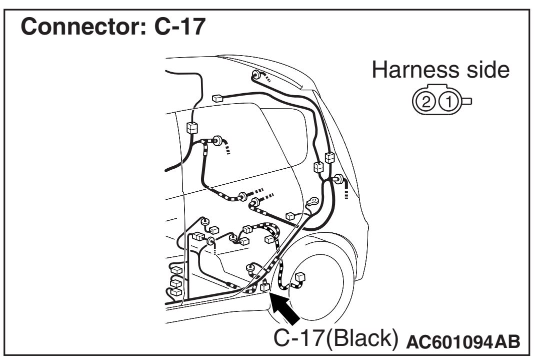
NO : Repair the damaged connector.

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STEP 13. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-17 wheel speed sensor <RL> connector





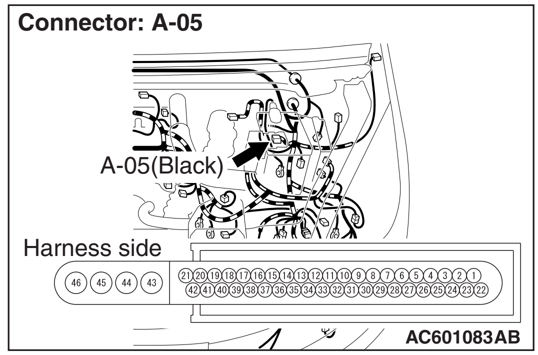


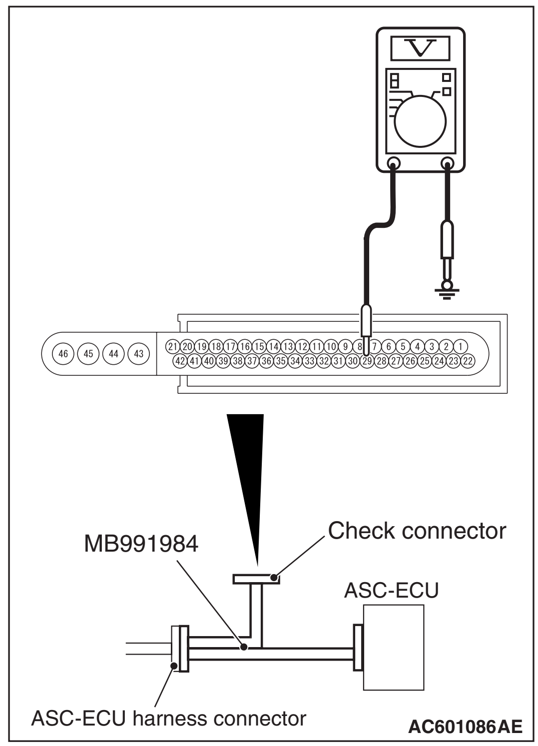
Q: Is the check result normal?

YES : Go to Step 22.

NO : Repair the damaged connector.

STEP 14. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the ASC-ECU side connector and harness-side connector, and then measure the voltage at the special tool connector side.
(2) Ignition switch: ON
(3) Measure the voltage between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

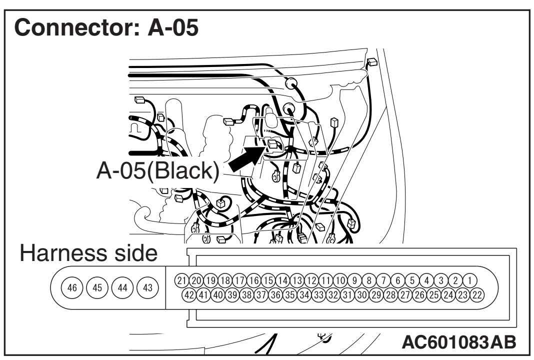
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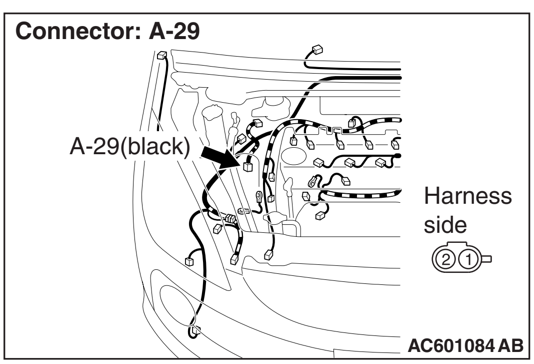
Diagnosis code No.	Checking terminal	
	Power supply terminal	Signal terminal
C1201	No. 29	No. 28
C1206	No. 34	No. 13
C1211	No. 30	No. 8
C1216	No. 11	No. 10

OK:
<Power supply terminal> Approximately 12 V
<Signal terminal> 0.4 to 1.3 V

Q: Is the check result normal?
YES : Go to Step 23.
NO (Not normal at the terminal No. 29 or 28) : Go to Step 15.
NO (Not normal at the terminal No. 34 or 13) : Go to Step 17.
NO (Not normal at the terminal No. 30 or 8) : Go to Step 19.
NO (Not normal at the terminal No. 11 or 10) : Go to Step 21.

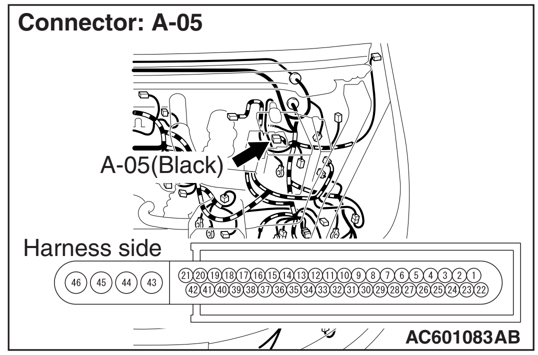
STEP 15. Connector check: A-05 ASC-ECU connector, A-29 wheel speed sensor <FR> connector

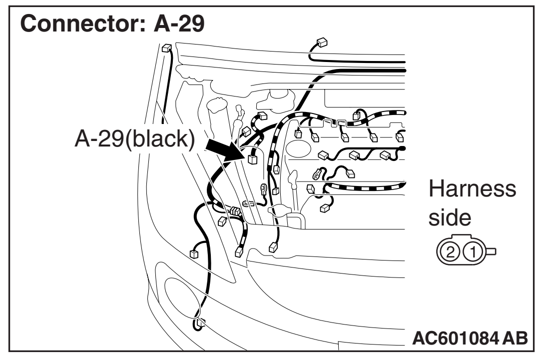




Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the damaged connector.

STEP 16. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 29, 28 and A-29 wheel speed sensor <FR> connector terminal No. 2, 1.

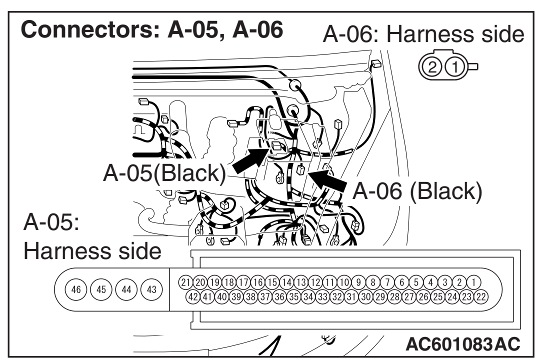




Check for short and open circuit in wheel speed sensor <FR> circuit

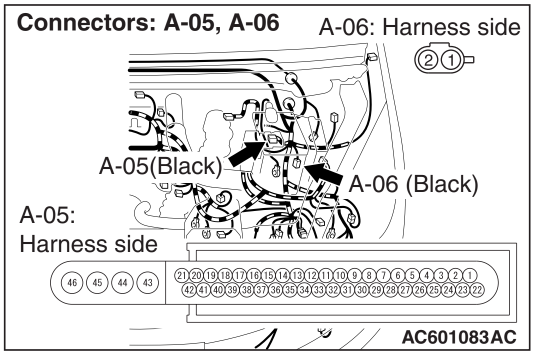
Q: Is the check result normal?
YES : Go to Step 23.
NO : Repair the wiring harness.

STEP 17. Connector check: A-05 ASC-ECU connector, A-06 wheel speed sensor <FL> connector



Q: Is the check result normal?
YES : Go to Step 18.
NO : Repair the damaged connector.

STEP 18. Check the harness wire between A-05 ASC-ECU connector terminal No. 34, 13 and A-06 wheel speed sensor <FL> connector terminal No. 2, 1.



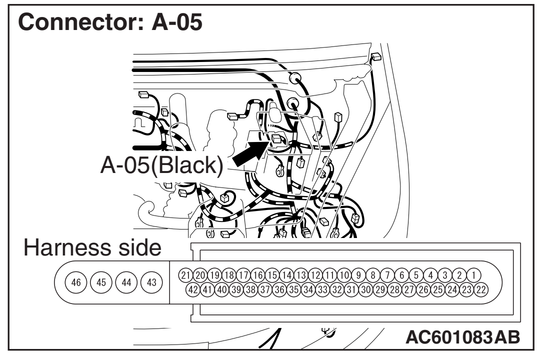
Check for short and open circuit in wheel speed sensor <FL> circuit

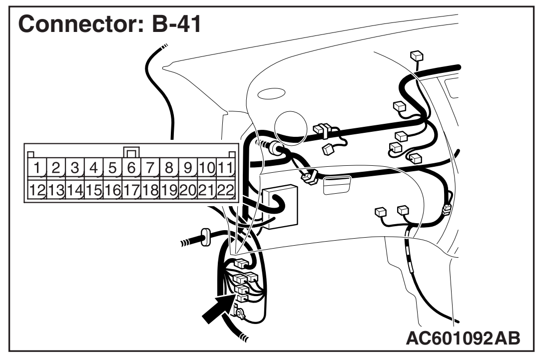
Q: Is the check result normal?

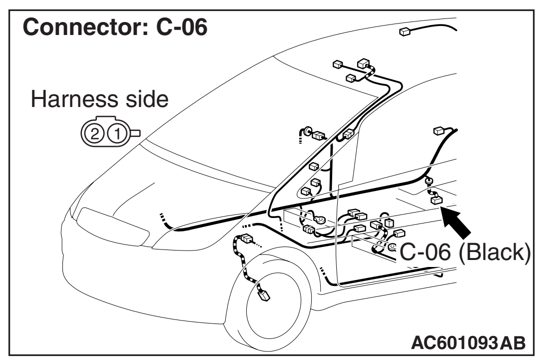
YES : Go to Step 23.

NO : Repair the wiring harness.

STEP 19. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-06 wheel speed sensor <RR> connector







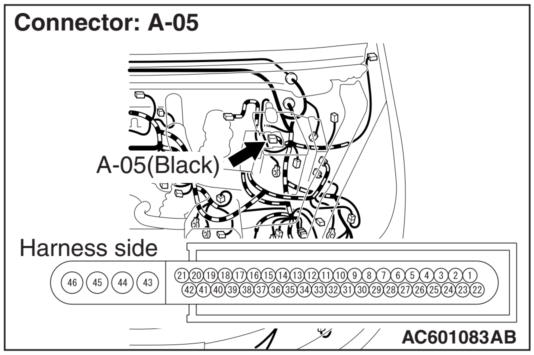
Q: Is the check result normal?

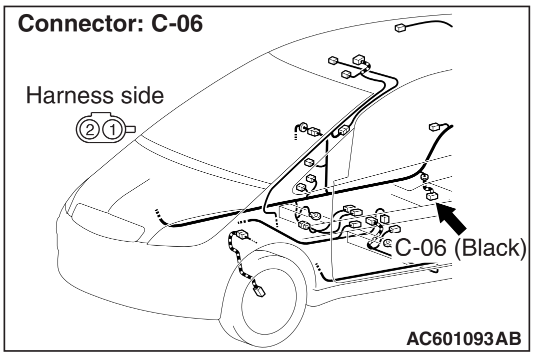
YES : Go to Step 20.

NO : Repair the damaged connector.

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STEP 20. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 11, 10 and C-06 wheel speed sensor <RR> connector terminal No. 2, 1.





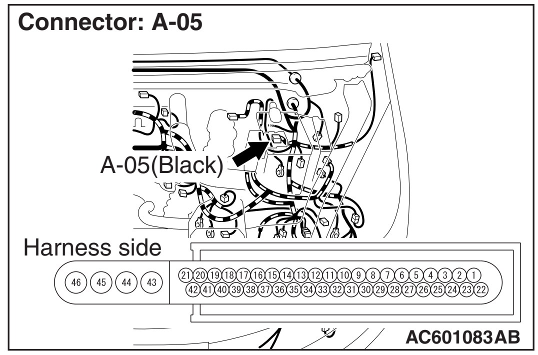
Check for short and open circuit in wheel speed sensor <RR> circuit

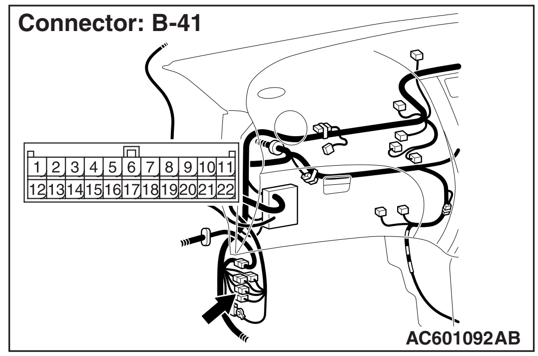
Q: Is the check result normal?

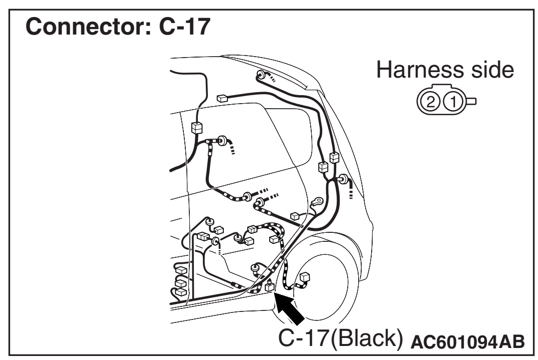
YES : Go to Step 23.

NO : Repair the wiring harness.

STEP 21. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-17 wheel speed sensor <RL> connector







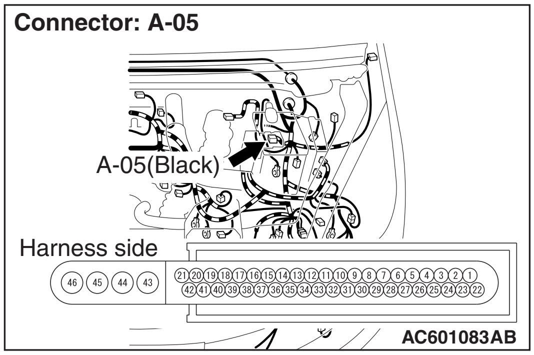
Q: Is the check result normal?

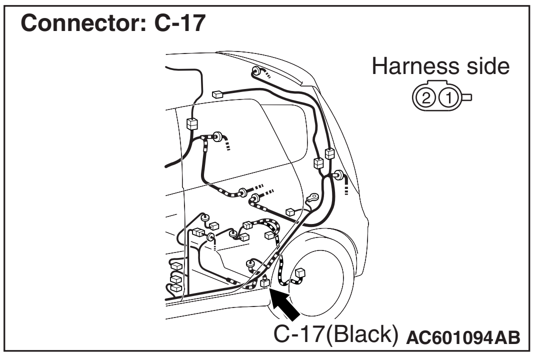
YES : Go to Step 22.

NO : Repair the damaged connector.

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STEP 22. Wiring harness check: between A-05 ASC-ECU connector terminal No. 11, 10 and C-17 wheel speed sensor <RL> connector terminal No. 2, 1.





Check for short and open circuit in wheel speed sensor <RL> circuit

Q: Is the check result normal?

YES : Go to Step 23.

NO : Repair the wiring harness.

STEP 23. ABS warning lamp OFF recheck

Drive the vehicle until the vehicle speed reaches 30km/h and check that the ABS warning lamp goes out.

Q: Does the ABS warning lamp extinguish?

YES : Go to Step 25.

NO : Replace the ASC-ECU, and then go to Step 24.

STEP 24. ABS warning lamp OFF recheck

Drive the vehicle until the vehicle speed reaches 30km/h and check that the ABS warning lamp goes out.

Q: Does the ABS warning lamp extinguish?

YES : Go to Step 25.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

STEP 25. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

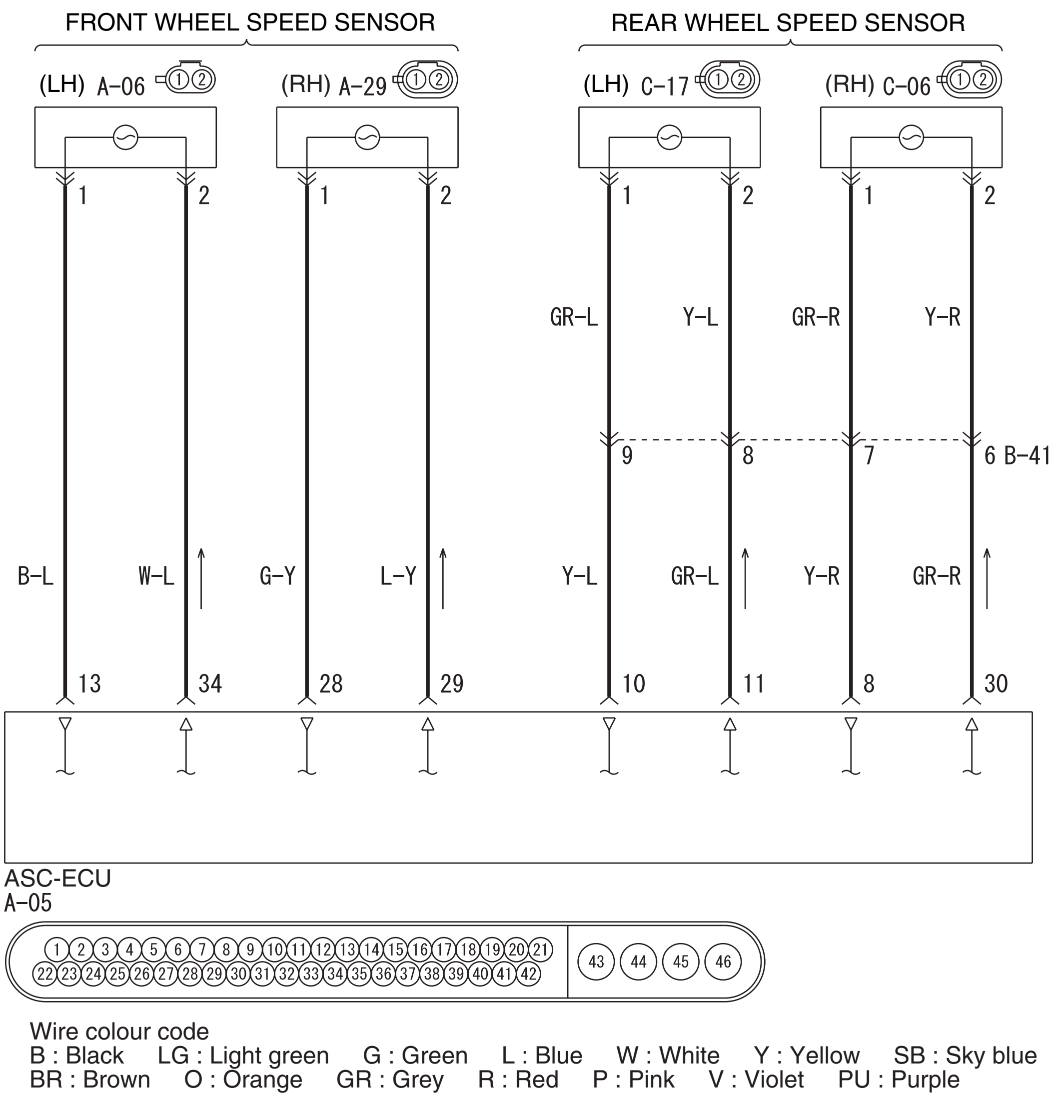
Q: Is the diagnosis code No.C1201, C1206, C1211 or C1216 set?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : This diagnosis is complete.

Code No. C1222: Wheel speed sensor system (abnormal power supply voltage)

Wheel Speed Sensor Circuit



W6N35L000A

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

The wheel speed sensors are energised by ASC-ECU. If an abnormality occurs in this power supply voltage, this diagnosis code is set.

PROBABLE CAUSES

- Short-circuited wheel speed sensor circuit and power supply circuit
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D − Troubleshooting P.54D-13.) On completion, go to Step 2.

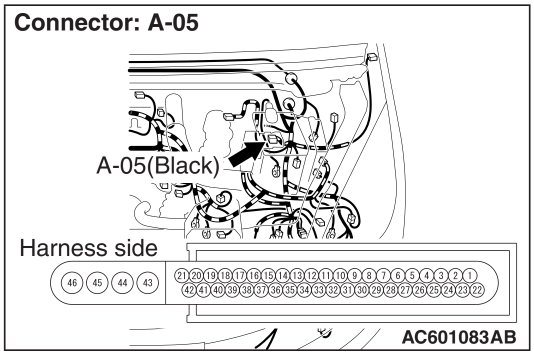
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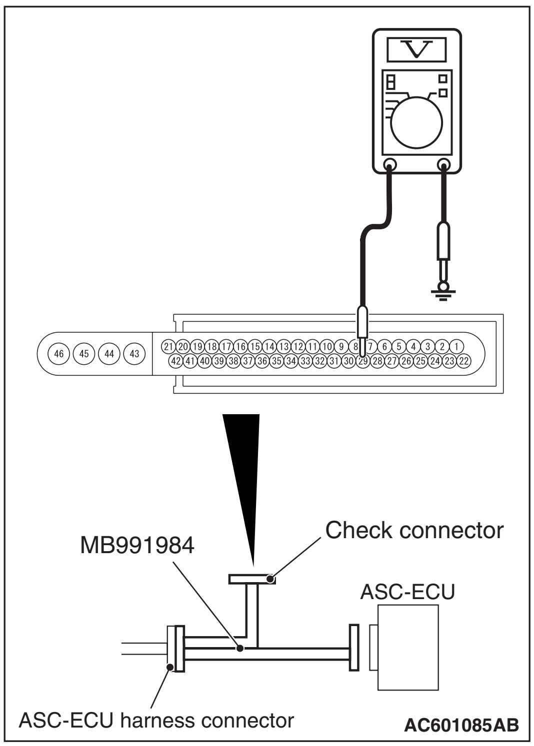
STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1222 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Ignition switch: ON
(3) Measure the voltage between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

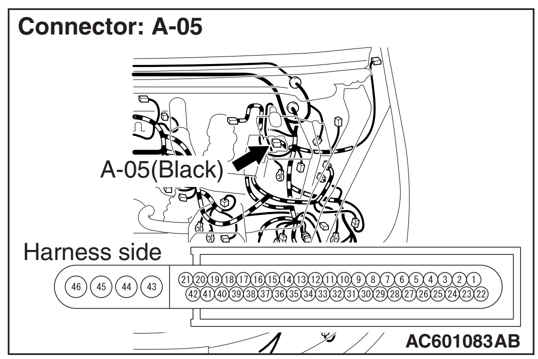
Wheel speed sensor position	Checking terminal	
	Power supply terminal	Signal terminal
Right front wheel	No. 29	No. 28
Left front wheel	No. 34	No. 13
Right rear wheel	No. 30	No. 8
Left rear wheel	No. 11	No. 10

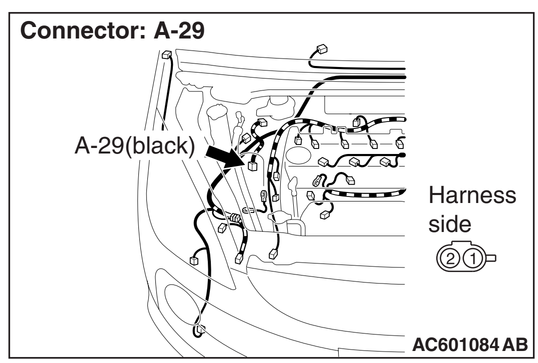
OK: 0 V

Q: Is the check result normal?

YES : Go to Step 12.
NO (Not normal at the terminal No. 29 or 28) : Go to Step 4.
NO (Not normal at the terminal No. 34 or 13) : Go to Step 6.
NO (Not normal at the terminal No. 30 or 8) : Go to Step 8.
NO (Not normal at the terminal No. 11 or 10) : Go to Step 10.

STEP 4. Connector check: A-05 ASC-ECU connector, A-29 wheel speed sensor <FR> connector



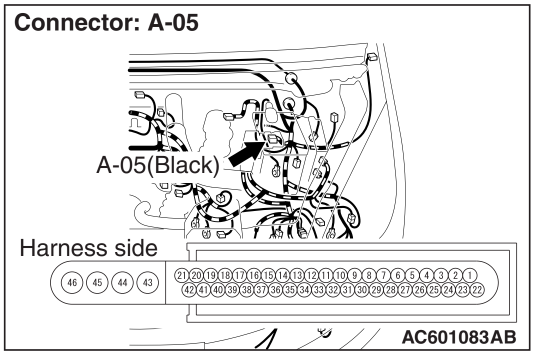


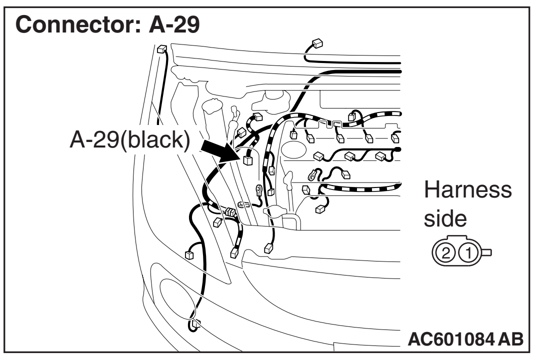
Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the damaged connector.

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STEP 5. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 29, 28 and A-29 wheel speed sensor <FR> connector terminal No. 2, 1.

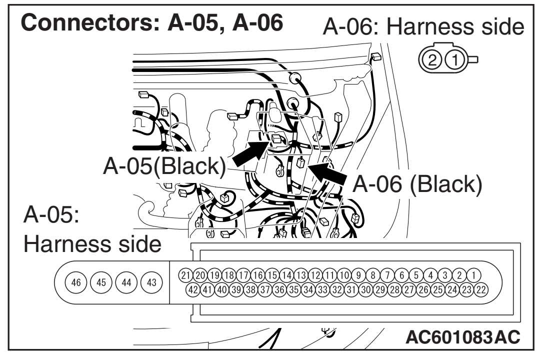




Check for short and open circuit in wheel speed sensor <FR> circuit

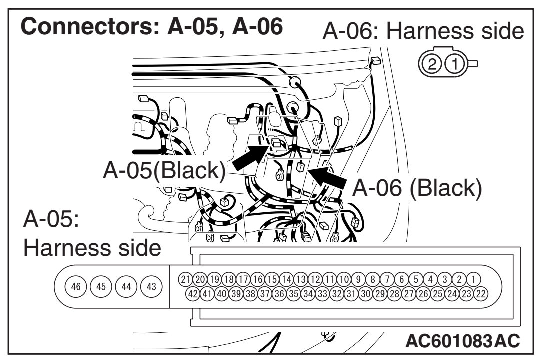
Q: Is the check result normal?
- **YES :** Go to Step 12.
- **NO :** Repair the wiring harness.

STEP 6. Connector check: A-05 ASC-ECU connector, A-06 wheel speed sensor <FL> connector



Q: Is the check result normal?
- **YES :** Go to Step 7.
- **NO :** Repair the damaged connector.

STEP 7. Check the harness wire between A-05 ASC-ECU connector terminal No. 34, 13 and A-06 wheel speed sensor <FL> connector terminal No. 2, 1.



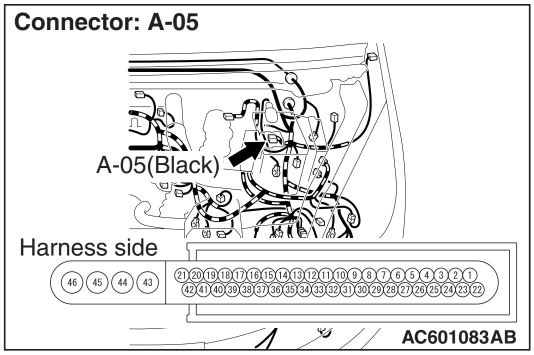
Check for short and open circuit in wheel speed sensor <FL> circuit

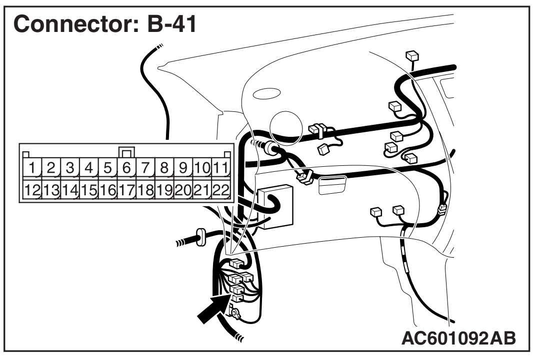
Q: Is the check result normal?
- **YES :** Go to Step 12.
- **NO :** Repair the wiring harness.

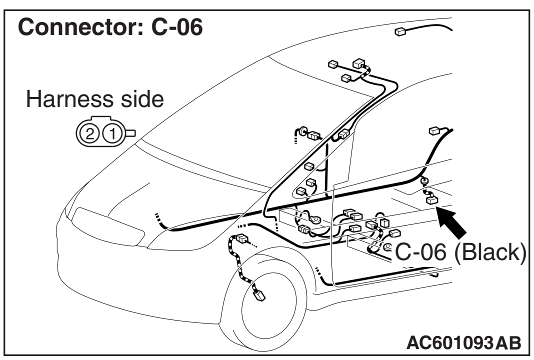
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STEP 8. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-06 wheel speed sensor <RR> connector

Q: Is the check result normal?

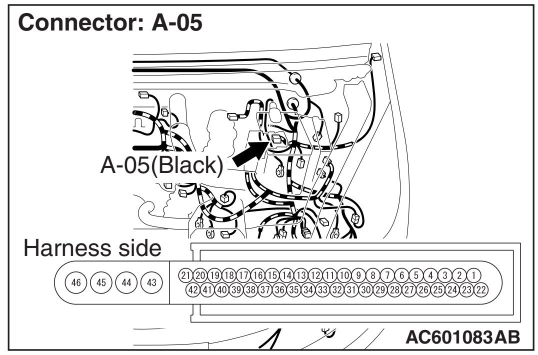


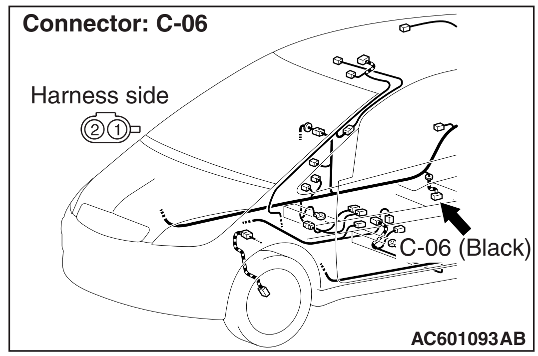




YES : Go to Step 9.
NO : Repair the damaged connector.

STEP 9. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 11, 10 and C-06 wheel speed sensor <RR> connector terminal No. 2, 1.



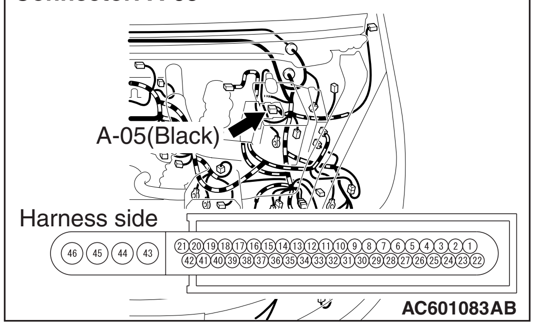


Check for short and open circuit in wheel speed sensor <RR> circuit

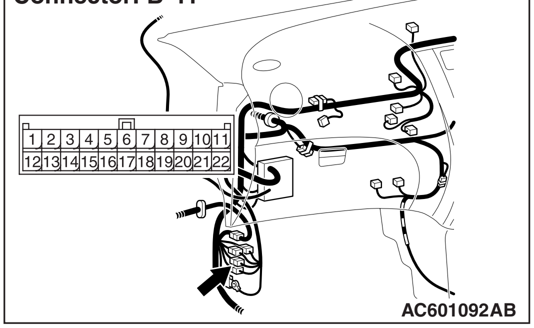
Q: Is the check result normal?
YES : Go to Step 12.
NO : Repair the wiring harness.

STEP 10. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-17 wheel speed sensor <RL> connector

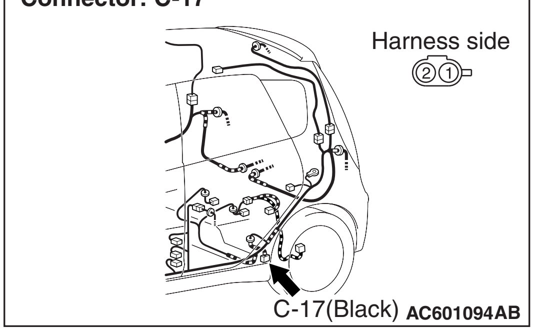
Connector: A-05



Connector: B-41



Connector: C-17



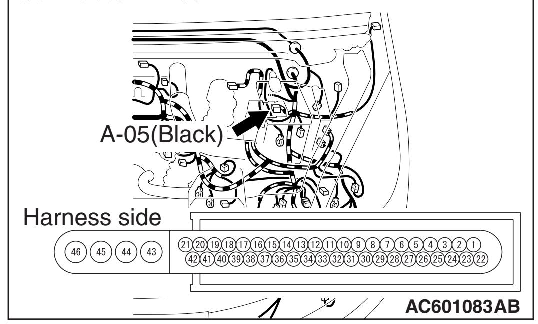
Q: Is the check result normal?

YES : Go to Step 11.

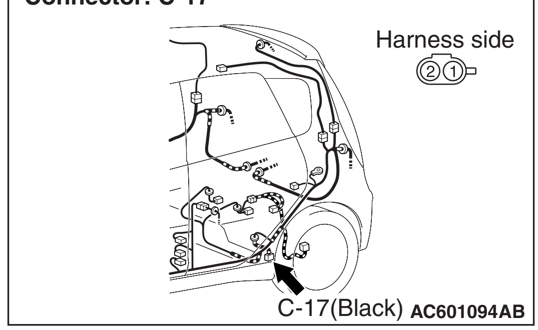
NO : Repair the damaged connector.

STEP 11. Wiring harness check: between A-05 ASC-ECU connector terminal No. 11, 10 and C-17 wheel speed sensor <RL> connector terminal No. 2, 1.

Connector: A-05



Connector: C-17



Check for short and open circuit in wheel speed sensor <RL> circuit

Q: Is the check result normal?

YES : Go to Step 12.

NO : Repair the wiring harness.

STEP 12. Diagnosis code recheck

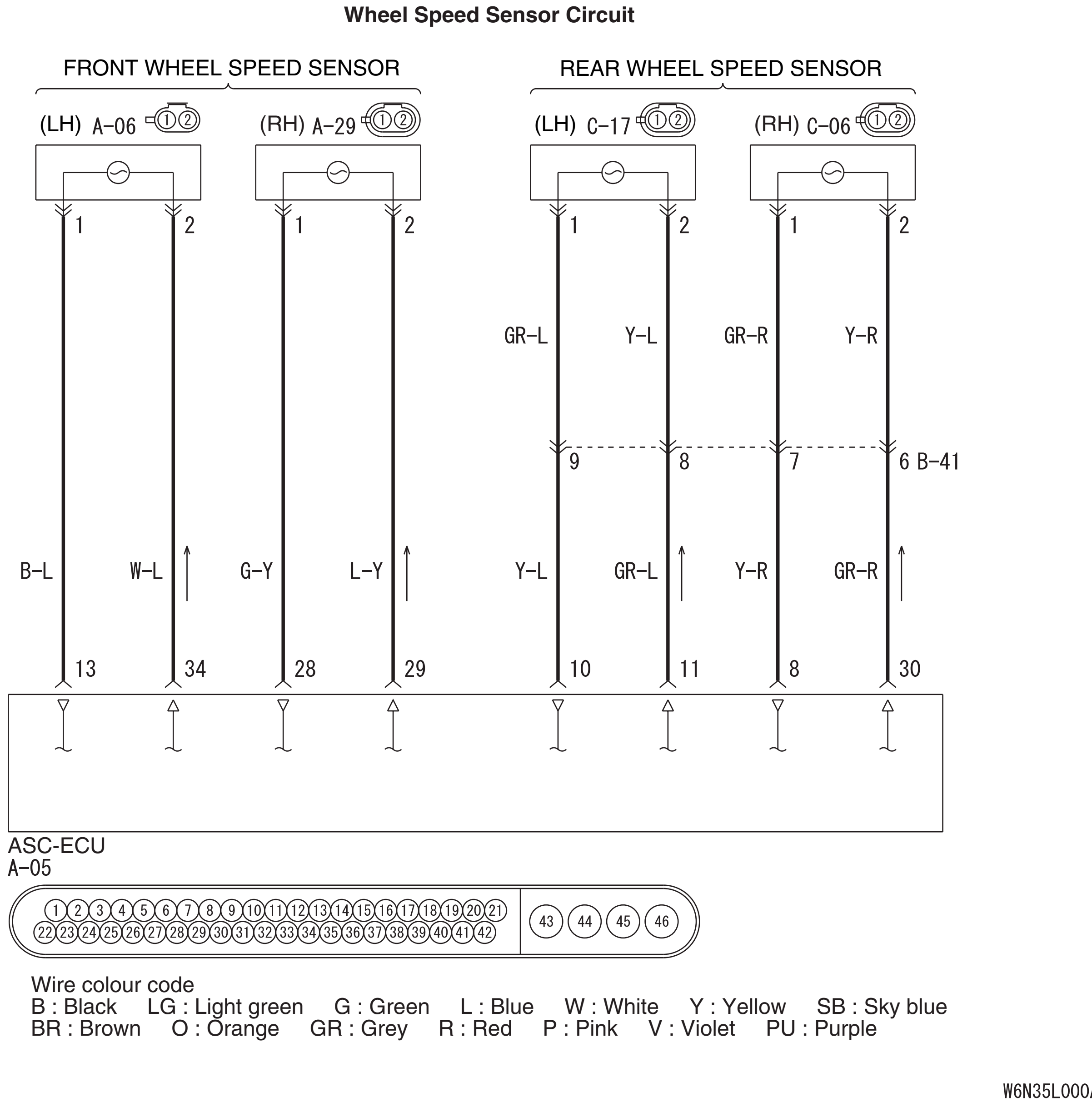
Q: Is diagnosis code No. C1222 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. C1225: Wheel speed sensor system (sensor output error)



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

- The wheel speed sensor is a kind of a pulse generator. It consists of magnetic encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

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DIAGNOSIS CODE SET CONDITIONS

The ASC-ECU monitors the signals from each wheel speed sensor. If any faults below is found in this sensor signal, the ECU will set the relevant diagnosis code. When the abnormal wheel is identified, the diagnosis code No. C1201, C1206, C1211, or C1216 is set.

- Missing sensor signal
- Sensor signal, which will not be created under normal operation
- Significant difference among the wheel speed sensor signals
- Continuous ABS or ASC control for one minute or more

PROBABLE CAUSES

Current trouble

- Improper installation of the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection magnetic encoder
- Deformation of the wheel speed detection magnetic encoder
- Excessive gap between the wheel speed sensor and the wheel speed detection magnetic encoder
- Damaged wiring harness and connectors
- Malfunction of the wheel speed sensor
- ASC-ECU malfunction

Past trouble

- The following conditions may occur.
  - Right or/and left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D, Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the relevant diagnosis code No. C1225 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Wheel speed sensor installation state check

Check the installation state (sensor disconnection, loose mounting bolts, etc.) of the wheel speed sensor for every wheel.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Reinstall the wheel speed sensor correctly.

STEP 4. Check for wheel speed sensor as a single unit

Refer to P.35B-81.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the wheel speed sensor.

STEP 5. Check for wheel bearing looseness

NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check each wheel bearing for looseness.

- Front: Refer to GROUP 26 – On-vehicle Service P.26-5.
- Rear: Refer to GROUP 27A – On-vehicle Service P.27-3.

Q: Is the check result normal?

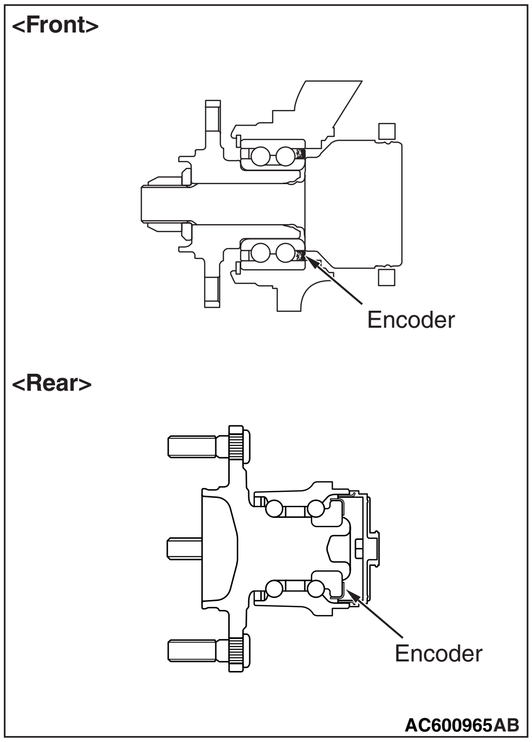
YES : Go to Step 6.

NO <when the relevant wheel is front> : Replace the wheel bearing. (Refer to GROUP 26 – Front Axle Hub P.26-13.)

NO <when the relevant wheel is rear> : Replace the rear hub assembly. (Refer to GROUP 27A – Rear Axle Hub P.27-6.)

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STEP 6. Wheel speed detection magnetic encoder check



Check the wheel speed detection magnetic encoder for adhesion of foreign materials or deformation.

NOTE: For the rear wheel speed detection magnetic encoder, check from the mounting hole of the wheel speed sensor by rotating the rear hub.

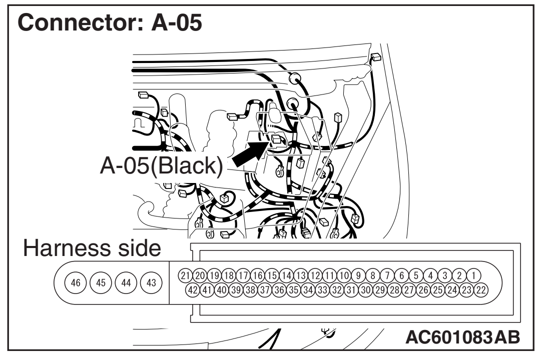
Q: Is the check result normal?

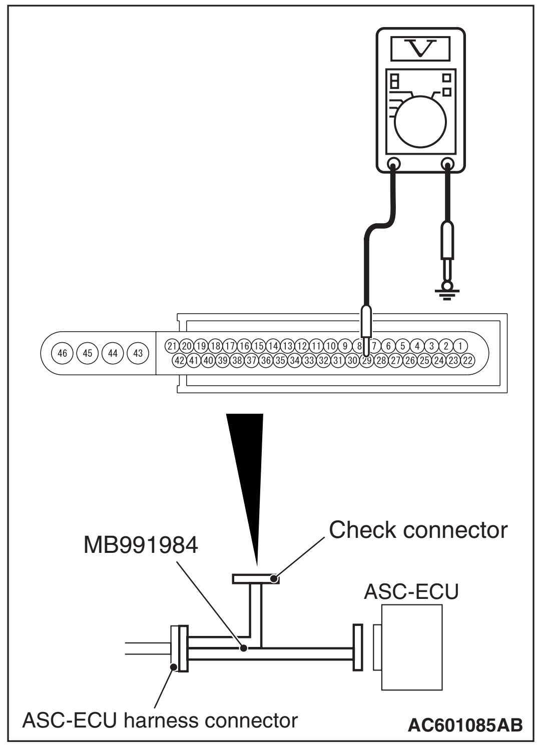
YES : Go to Step 7.

NO <when the relevant wheel is front> : When a foreign material adheres to the encoder, clean it. When the encoder is deformed, replace the wheel bearing. (Refer to GROUP 26 – Front Axle Hub P.26-13.)

NO <when the relevant wheel is rear> : When a foreign material adheres to the encoder, clean it. When the encoder is deformed, replace the rear hub assembly. (Refer to GROUP 27A – Rear Axle Hub P.27-6.)

STEP 7. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Ignition switch: ON

(3) Measure the voltage between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

Wheel speed sensor position	Checking terminal	
	Power supply terminal	**Signal terminal**
Right front wheel	No. 29	No. 28
Left front wheel	No. 34	No. 13
Right rear wheel	No. 30	No. 8
Left rear wheel	No. 11	No. 10

OK: 0 V

Q: Is the check result normal?

YES : Go to Step 8.

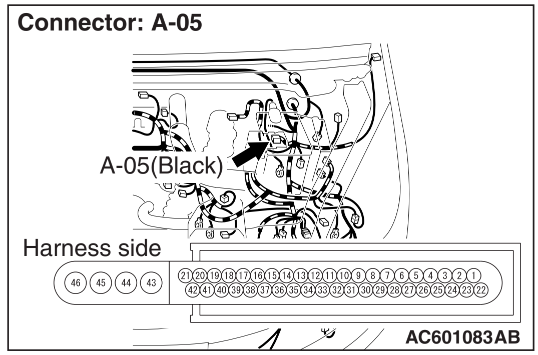
NO (Not normal at the terminal No. 29 or 28) : Go to Step 9.

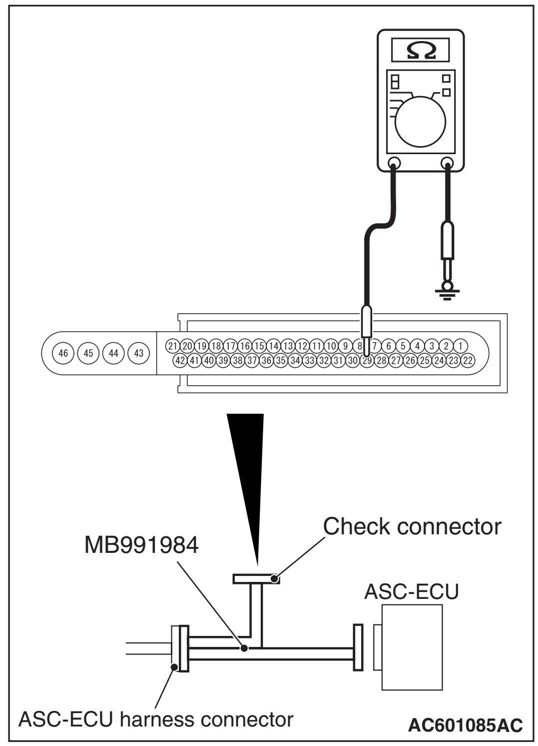
NO (Not normal at the terminal No. 34 or 13) : Go to Step 10.

NO (Not normal at the terminal No. 30 or 8) : Go to Step 11.

NO (Not normal at the terminal No. 11 or 10) : Go to Step 12.

STEP 8. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

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Wheel speed sensor position	Checking terminal	
	Power supply terminal	Signal terminal
Right front wheel	No. 29	No. 28
Left front wheel	No. 34	No. 13
Right rear wheel	No. 30	No. 8
Left rear wheel	No. 11	No. 10

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 13.

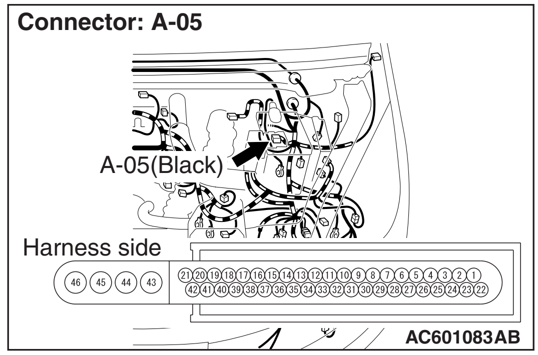
NO (Not normal at the terminal No. 29 or 28) : Go to Step 9.

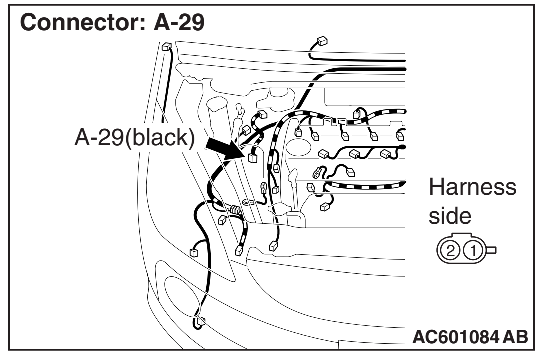
NO (Not normal at the terminal No. 34 or 13) : Go to Step 10.

NO (Not normal at the terminal No. 30 or 8) : Go to Step 11.

NO (Not normal at the terminal No. 11 or 10) : Go to Step 12.

STEP 9. Connector check: A-05 ASC-ECU connector, A-29 wheel speed sensor <FR> connector



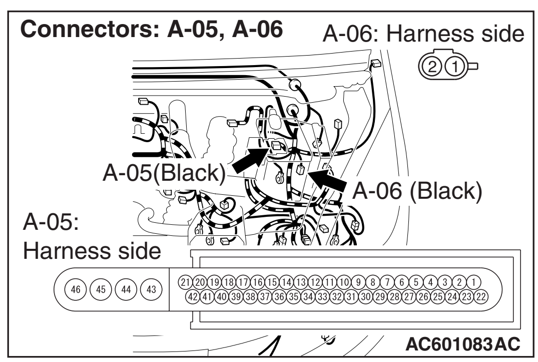


Q: Is the check result normal?

YES : Go to Step 15.

NO : Repair the damaged connector.

STEP 10. Connector check: A-05 ASC-ECU connector, A-06 wheel speed sensor <FL> connector



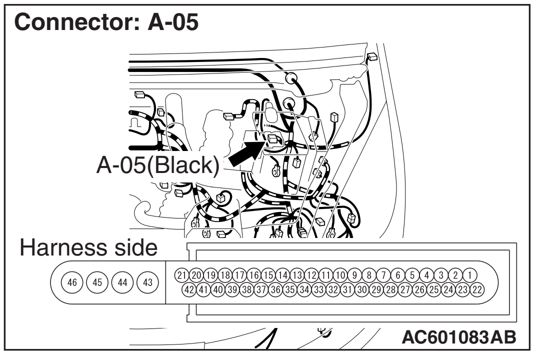
Q: Is the check result normal?

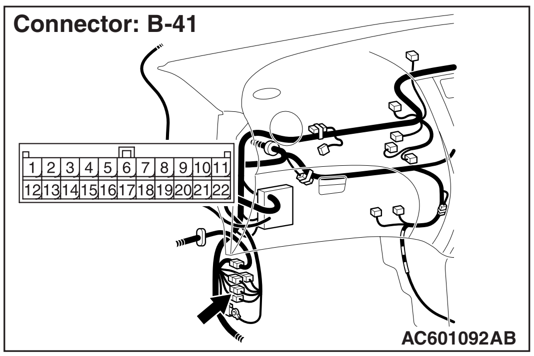
YES : Go to Step 17.

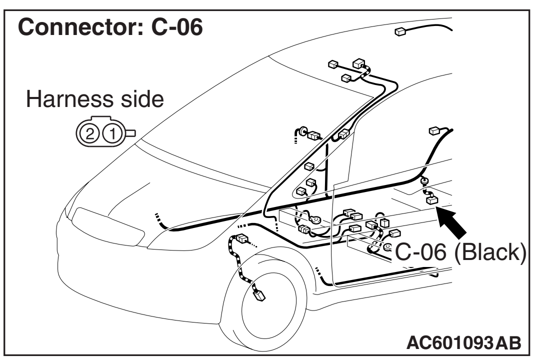
NO : Repair the damaged connector.

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STEP 11. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-06 wheel speed sensor <RR> connector





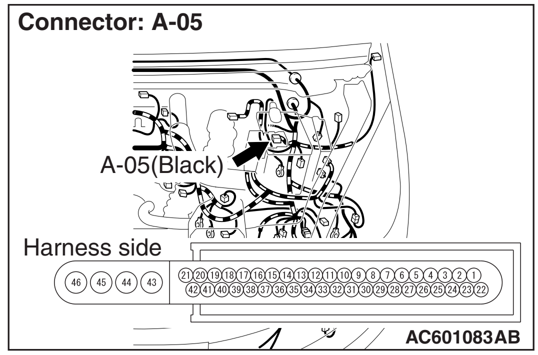


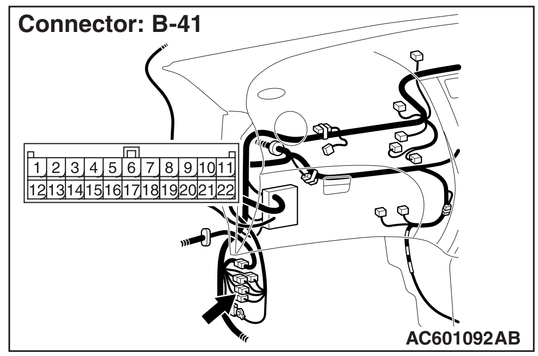
Q: Is the check result normal?

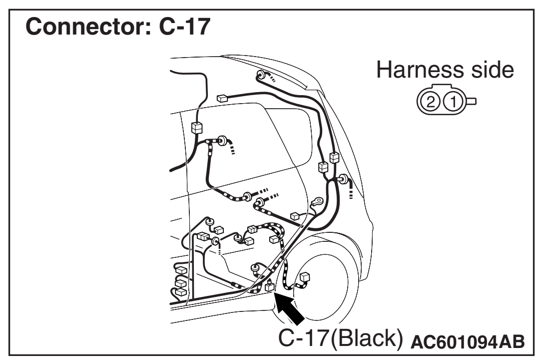
YES : Go to Step 19.

NO : Repair the damaged connector.

STEP 12. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-17 wheel speed sensor <RL> connector







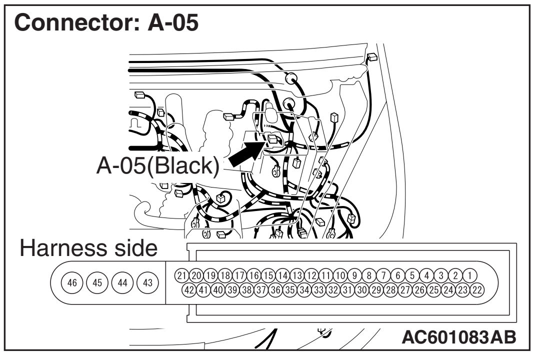
Q: Is the check result normal?

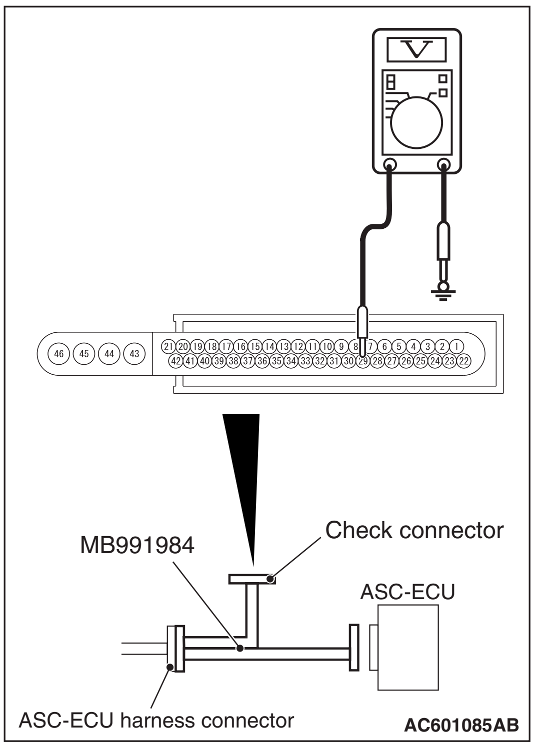
YES : Go to Step 21.

NO : Repair the damaged connector.

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STEP 13. Voltage measurement: A-05 ASC-ECU connector





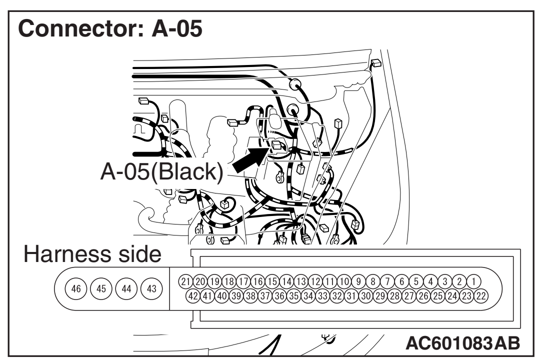
(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the ASC-ECU side connector and harness-side connector, and then measure the voltage at the special tool connector side.
(2) Ignition switch: ON
(3) Measure the voltage between the power supply and signal terminals in the wheel speed sensor circuit and body earth.

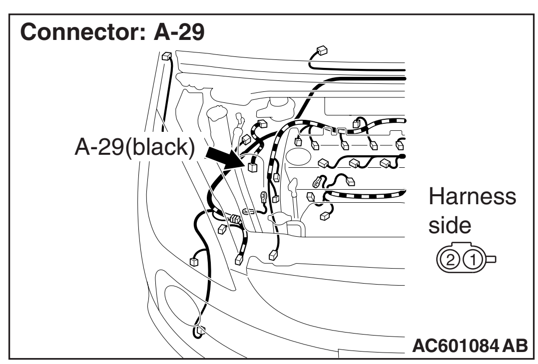
Wheel speed sensor position	Checking terminal	
	Power supply terminal	Signal terminal
Right front wheel	No. 29	No. 28
Left front wheel	No. 34	No. 13
Right rear wheel	No. 30	No. 8
Left rear wheel	No. 11	No. 10

OK:
<Power supply terminal> Approximately 12 V
<Signal terminal> 0.4 to 1.3 V

Q: Is the check result normal?
YES : Go to Step 22.
NO (Not normal at the terminal No. 29 or 28) : Go to Step 14.
NO (Not normal at the terminal No. 34 or 13) : Go to Step 16.
NO (Not normal at the terminal No. 30 or 8) : Go to Step 18.
NO (Not normal at the terminal No. 11 or 10) : Go to Step 20.

STEP 14. Connector check: A-05 ASC-ECU connector, A-29 wheel speed sensor <FR> connector

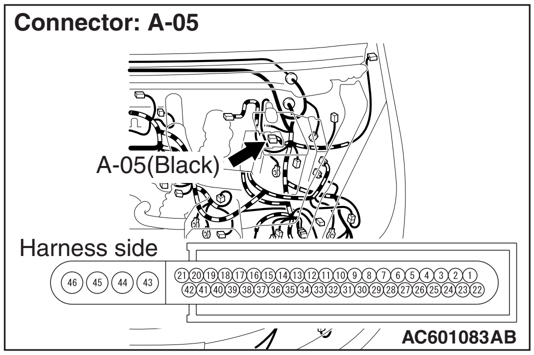


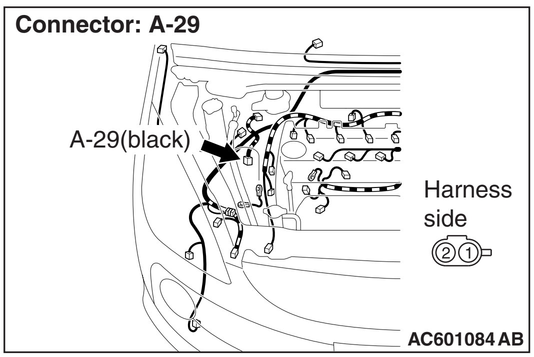


Q: Is the check result normal?
YES : Go to Step 15.
NO : Repair the damaged connector.

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STEP 15. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 29, 28 and A-29 wheel speed sensor <FR> connector terminal No. 2, 1.





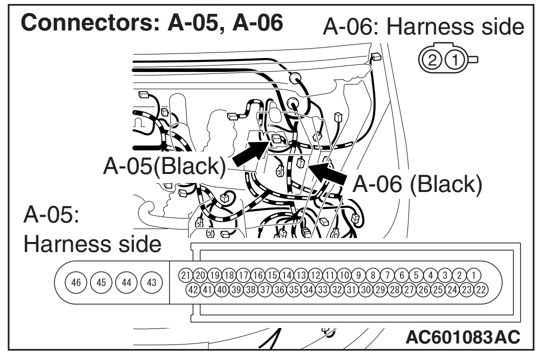
Check for short and open circuit in wheel speed sensor <FR> circuit

Q: Is the check result normal?

YES : Go to Step 22.

NO : Repair the wiring harness.

STEP 16. Connector check: A-05 ASC-ECU connector, A-06 wheel speed sensor <FL> connector

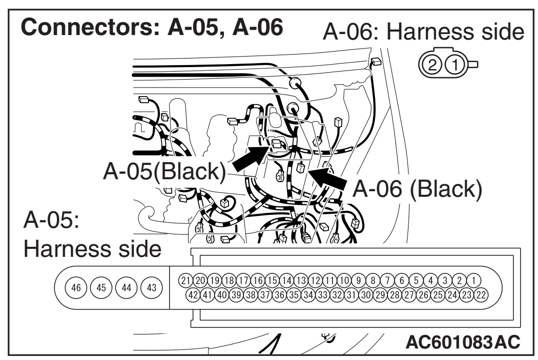


Q: Is the check result normal?

YES : Go to Step 17.

NO : Repair the damaged connector.

STEP 17. Check the harness wire between A-05 ASC-ECU connector terminal No. 34, 13 and A-06 wheel speed sensor <FL> connector terminal No. 2, 1.



Check for short and open circuit in wheel speed sensor <FL> circuit

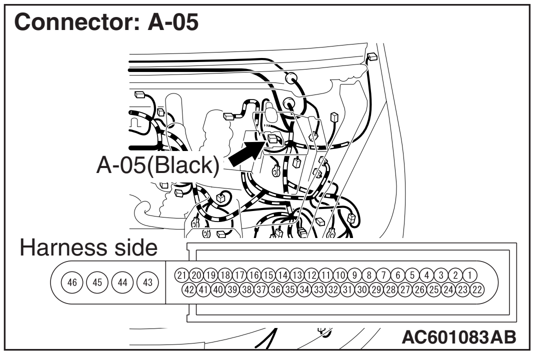
Q: Is the check result normal?

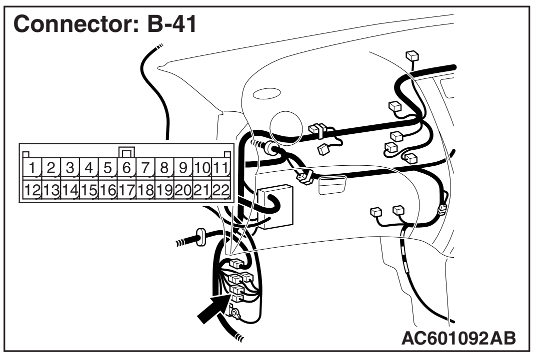
YES : Go to Step 22.

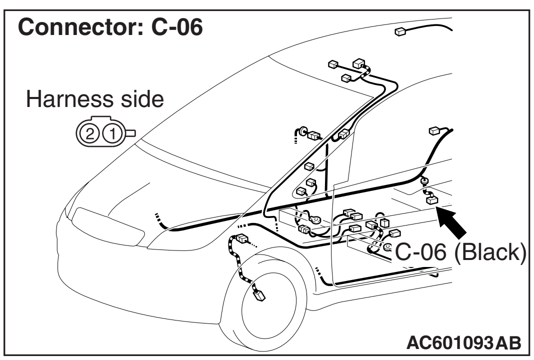
NO : Repair the wiring harness.

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STEP 18. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-06 wheel speed sensor <RR> connector





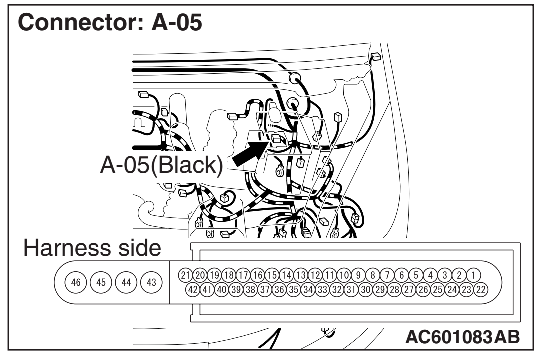


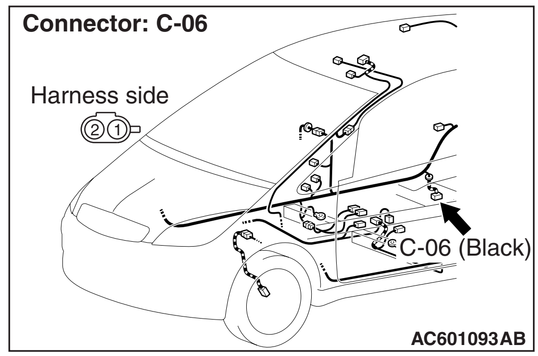
Q: Is the check result normal?

YES : Go to Step 19.

NO : Repair the damaged connector.

STEP 19. Wiring harness inspection: between A-05 ASC-ECU connector terminal No. 30, 8 and C-06 wheel speed sensor <RR> connector terminal No. 2, 1.





Check for short and open circuit in wheel speed sensor <RR> circuit

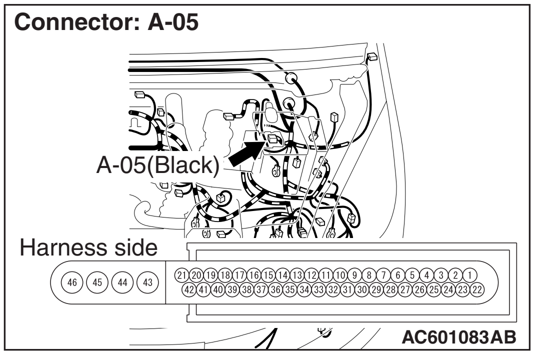
Q: Is the check result normal?

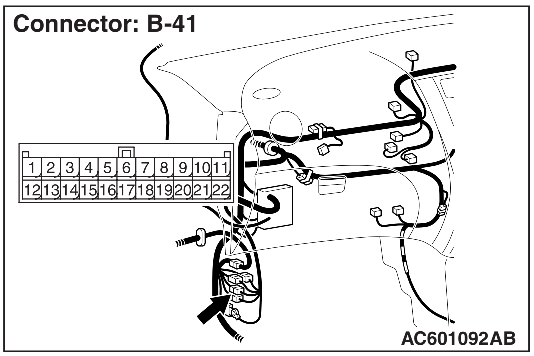
YES : Go to Step 22.

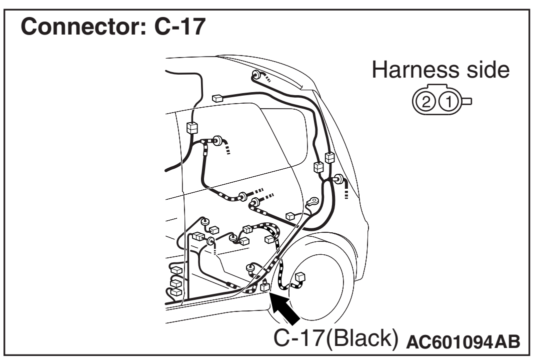
NO : Repair the wiring harness.

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STEP 20. Connector check: A-05 ASC-ECU connector, B-41 intermediate connector, C-17 wheel speed sensor <RL> connector





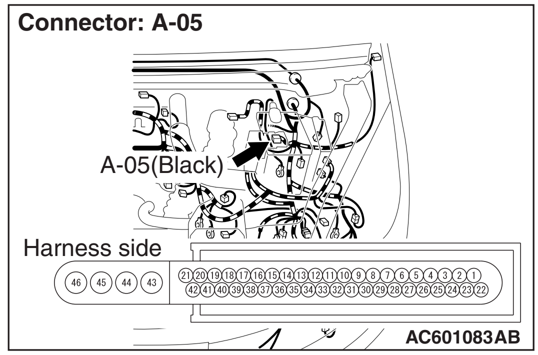


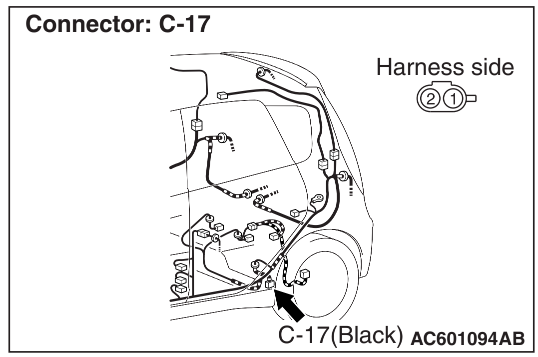
Q: Is the check result normal?

YES : Go to Step 21.

NO : Repair the damaged connector.

STEP 21. Wiring harness check: between A-05 ASC-ECU connector terminal No. 11, 10 and C-17 wheel speed sensor <RL> connector terminal No. 2, 1.





Check for short and open circuit in wheel speed sensor <RL> circuit

Q: Is the check result normal?

YES : Go to Step 22.

NO : Repair the wiring harness.

STEP 22. ABS warning lamp OFF recheck

Drive the vehicle until the vehicle speed reaches 30km/h and check that the ABS warning lamp goes out.

Q: Does the ABS warning lamp extinguish?

YES : Go to Step 24.

NO : Replace the ASC-ECU, and then go to Step 23.

STEP 23. ABS warning lamp OFF recheck

Drive the vehicle until the vehicle speed reaches 30km/h and check that the ABS warning lamp goes out.

Q: Does the ABS warning lamp extinguish?

YES : Go to Step 24.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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STEP 24. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1225 set?

YES : . Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : . This diagnosis is complete.

Code No. C1226: Control solenoid valve (FR) pressure holding system
Code No. C1231: Control solenoid valve (FR) decompressing system
Code No. C1236: Control solenoid valve (FL) pressure holding system
Code No. C1241: Control solenoid valve (FL) pressure reducing system
Code No. C1246: Control solenoid valve (RR) pressure holding system
Code No. C1251: Control solenoid valve (RR) pressure reducing system
Code No. C1256: Control solenoid valve (RL) pressure holding system
Code No. C1261: Control solenoid valve (RL) decompressing system
Code No. C1300: Cut valve (FR/RL) <primary> system
Code No. C1305: Suction valve (FR/RL) <primary> system
Code No. C1310: Cut valve (FL/RR) <secondary> system
Code No. C1315: Suction valve (FL/RR) <secondary> system

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

- ASC-ECU contains the power supply circuit (terminal No. 44) for the solenoid valve, cut valve, and suction valve. The solenoid valve, cut valve, and suction valve are energised by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is energising the solenoid valve, cut valve, ad suction valve unless the initial check is in progress when the ignition switch is turned on, or the recurrent system check is in progress.
- ASC-ECU activates the solenoid valve by turning on its driving transistor.

DIAGNOSIS CODE SET CONDITIONS

Code No. C1226, C1231, C1236, C1241, C1246, C1251, C1256 and C1261.

- These codes are set when the ASC-ECU drive signal does not match the feed back signal from the solenoid valve.

Code No. C1300, C1305, C1310, and C1315

- These codes are set when an abnormality is detected in ASC-ECU.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Replace the ASC-ECU.

NO : Repair the CAN bus lines. (Refer to GROUP 54D, Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Are the diagnosis code C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310, and C1315 set?

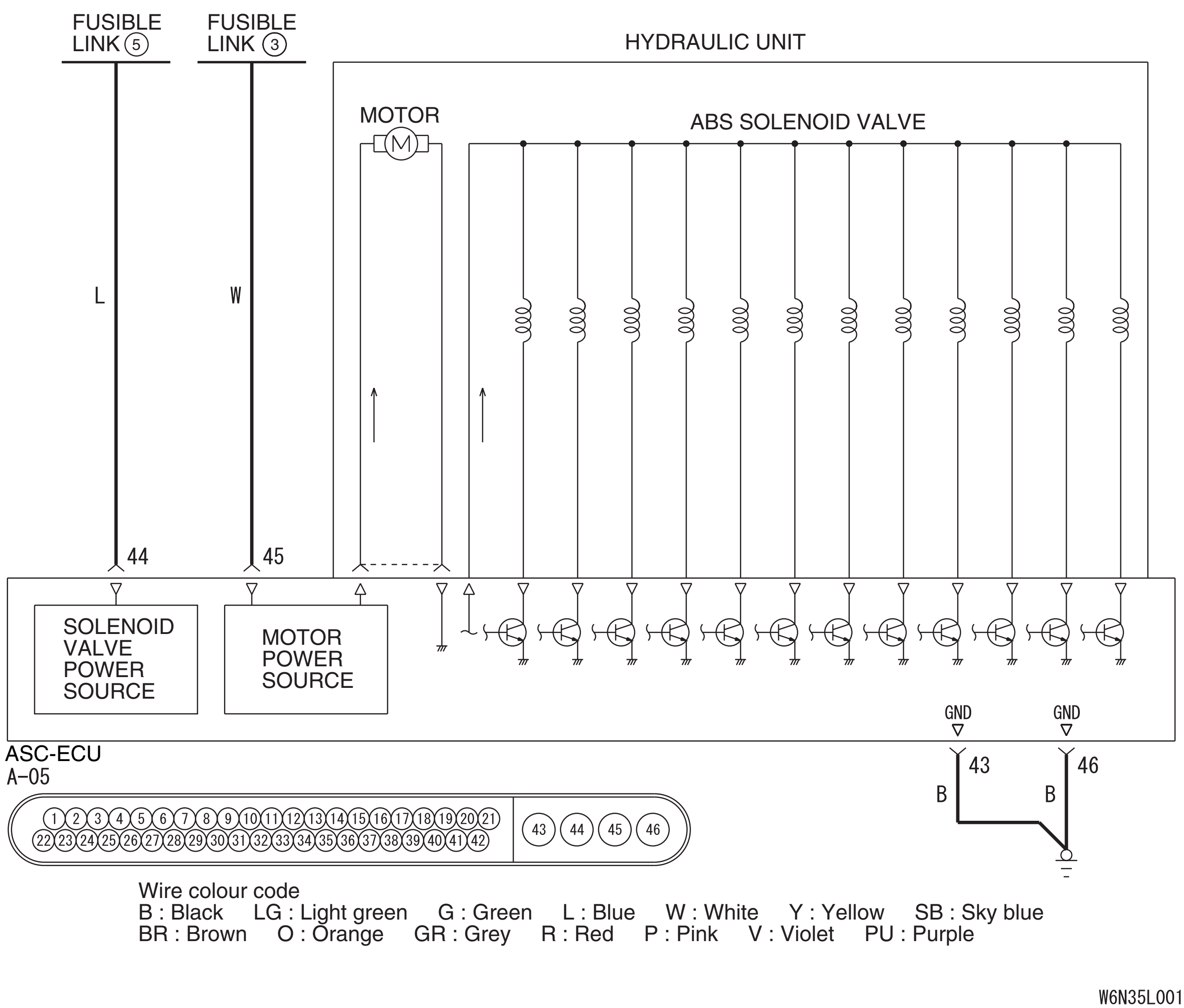
YES : Replace the ASC-ECU.

NO : This diagnosis is complete.

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Code No. C1266: Motor relay seizure
Code No. C1273: Motor relay stuck OFF
Code No. C1274: Motor relay stuck ON

Hydraulic unit (Motor and Solenoid Valve) Circuit



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

- ASC-ECU contains the power supply circuit (terminal 45) for the pump motor. The pump motor is energised by the motor relay, which is incorporated in ASC-ECU.
- The motor relay, which is incorporated in ASC-ECU, is always off unless the motor solenoid valve check is activated when the vehicle is started.
- ASC-ECU activates the pump motor by turning on the ECU built-in motor relay when ABS or ASC is working.

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DIAGNOSIS CODE SET CONDITIONS

These diagnostic trouble codes will be set under the cases below.

Code No. C1266: Motor relay seizure

- The ABS-ECU monitors the voltage, which is created by the pump motor coasting, after the motor relay is turned off. If the voltage continues only for too short period, the ECU determines that the pump motor is not running smoothly (i.e. motor seizure), and sets this diagnosis code.

Code No. C1273: Motor relay stuck OFF

- If the voltage, which is created by the pump motor, is abnormal after the motor relay is turned on, the ECU determines that the motor relay is stuck off, and sets this diagnosis code.

Code No. C1274: Motor relay stuck ON

- If the voltage, which is created by the pump motor, is abnormal after the motor relay is turned off, the ECU determines that the motor relay is stuck on, and sets this diagnosis code.

PROBABLE CAUSES

Current trouble

- Damaged wiring harness and connectors
- ASC-ECU malfunction

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the power supply circuit (terminal 45) to the ASC-ECU motor or earth circuit (terminal 46). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

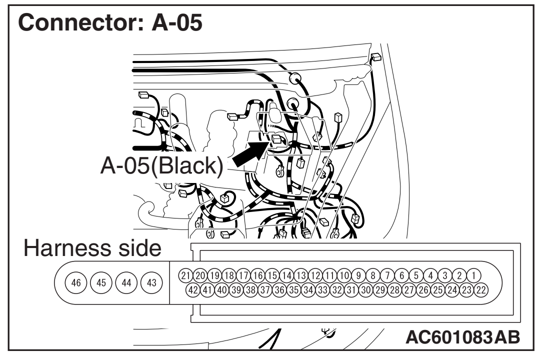
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

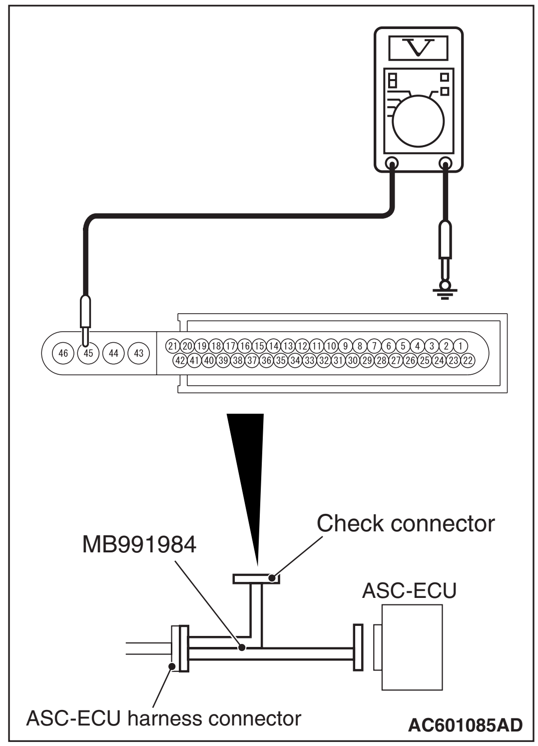
STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Has diagnosis code C1266, C1273 or C1274 been set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Ignition switch: ON

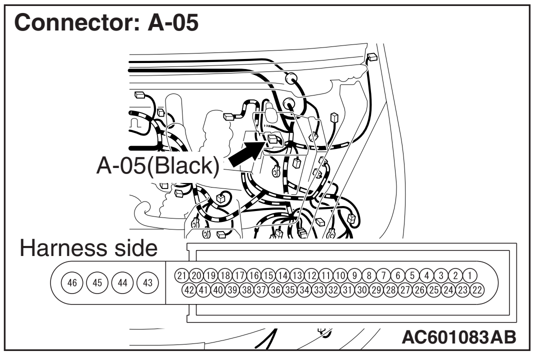
(3) Measure the voltage between the terminal No. 45 and the body earth.

OK: Battery voltage

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Connector check: A-05 ASC-ECU connector

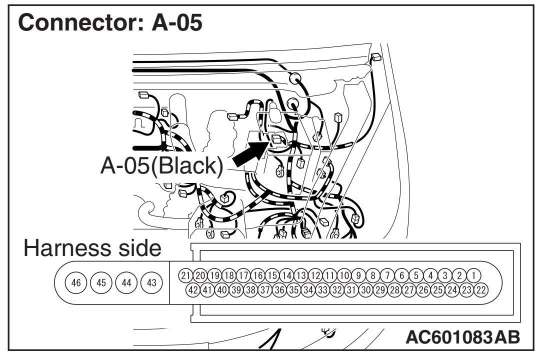


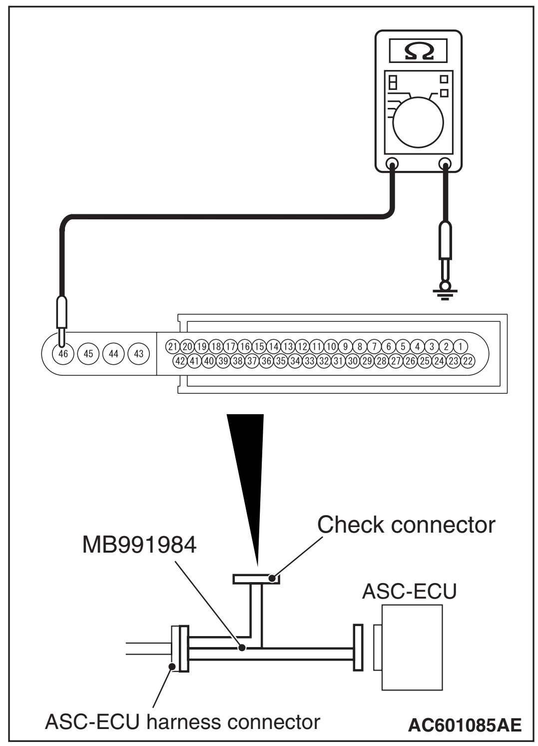
Q: Is the check result normal?

YES : The open or short circuit may be present in the power supply circuit to the motor. Repair the harness wire between the ASC-ECU connector terminal No. 45 and the fusible link No. 3. Then go to Step 8.

NO : Repair the connector, and then go to Step 8.

STEP 5. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between terminal No. 46 and the body earth.

OK: Continuity exists (2 Ω or less)

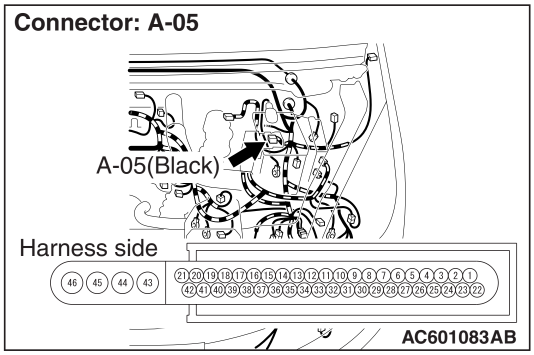
Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 6.

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STEP 6. Connector check: A-05 ASC-ECU connector



Q: Is the check result normal?

YES : An open circuit may be present in the earth circuit. Repair the wiring harness between the A-05 ASC-ECU terminal No. 46 and the body earth. Then go to Step 8.

NO : Repair the connector, and then go to Step 8.

STEP 7. ABS warning lamp OFF recheck

Drive the vehicle until the vehicle speed reaches 40 km/h and check that the ABS warning lamp goes out.

Q: Does the ABS warning lamp extinguish?

YES : Go to Step 9.

NO : Replace the ASC-ECU, and then go to Step 8.

STEP 8. ABS warning lamp OFF recheck

Drive the vehicle until the vehicle speed reaches 40 km/h and check that the ABS warning lamp goes out.

Q: Does the ABS warning lamp extinguish?

YES : Go to Step 9.

NO : Return to Step 1.

STEP 9. Diagnosis code recheck

Recheck if the diagnosis code is set.

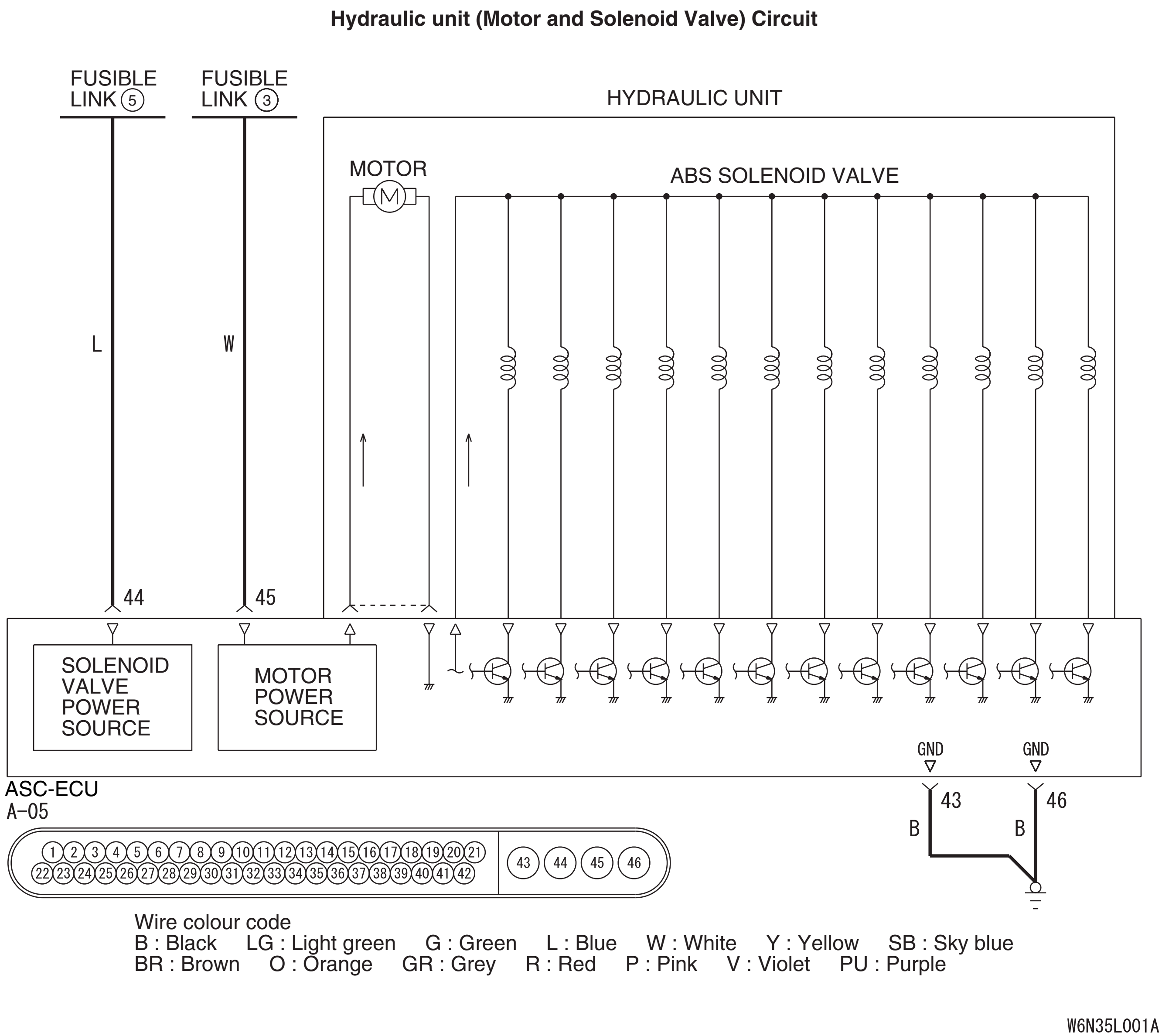
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1266, C1273 or C1274 set?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : This diagnosis is complete.

Code No. C1276: Valve relay system



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

- ASC-ECU contains the power supply circuit (terminal No. 44) for the solenoid valve. The solenoid valve is energised by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is always energising the solenoid valve unless the initial check is in progress when the ignition switch is turned on, or the recurrent system check is in progress.

DIAGNOSIS CODE SET CONDITIONS

The ECU monitors the power supply voltage to the solenoid valve. If the voltage is not within the predetermined value, the ECU sets this diagnosis code as a failure in the valve relay circuit.

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PROBABLE CAUSES

Current trouble

- Damaged wiring harness and connectors
- ASC-ECU malfunction

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the power supply circuit (terminal No. 44) to the ASC-ECU solenoid valve or earth circuit (terminal No. 46). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

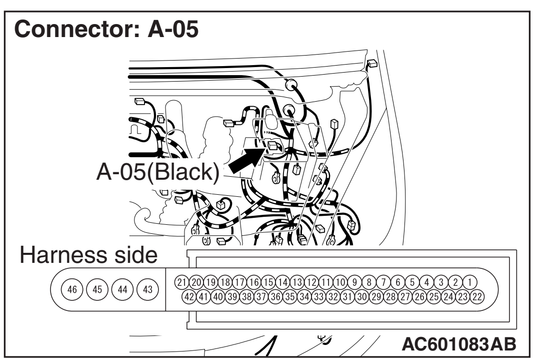
STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1276 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Connector check: A-05 ASC-ECU connector

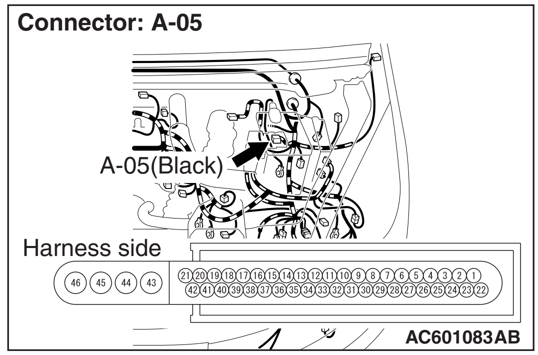


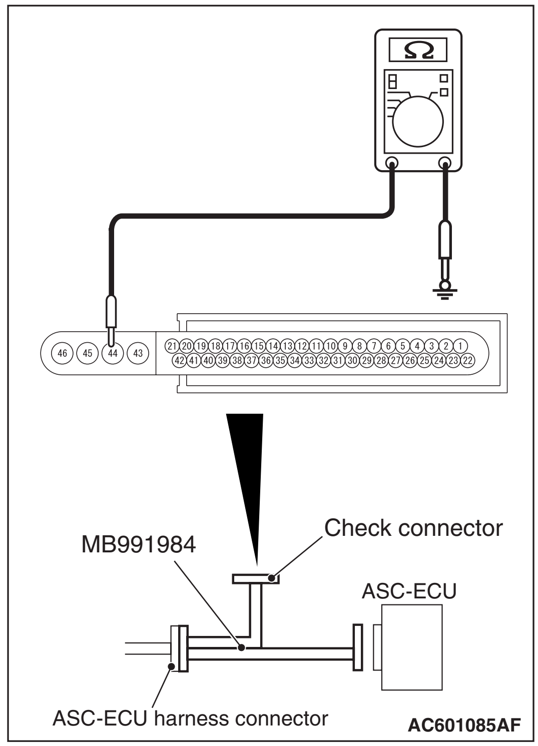
Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the damaged connector.

STEP 4. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the terminal No. 44 and the positive battery terminal.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the wiring harness between the terminal No. 44 and the positive battery terminal.

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STEP 5. Diagnosis code recheck

Recheck if the diagnosis code is set.

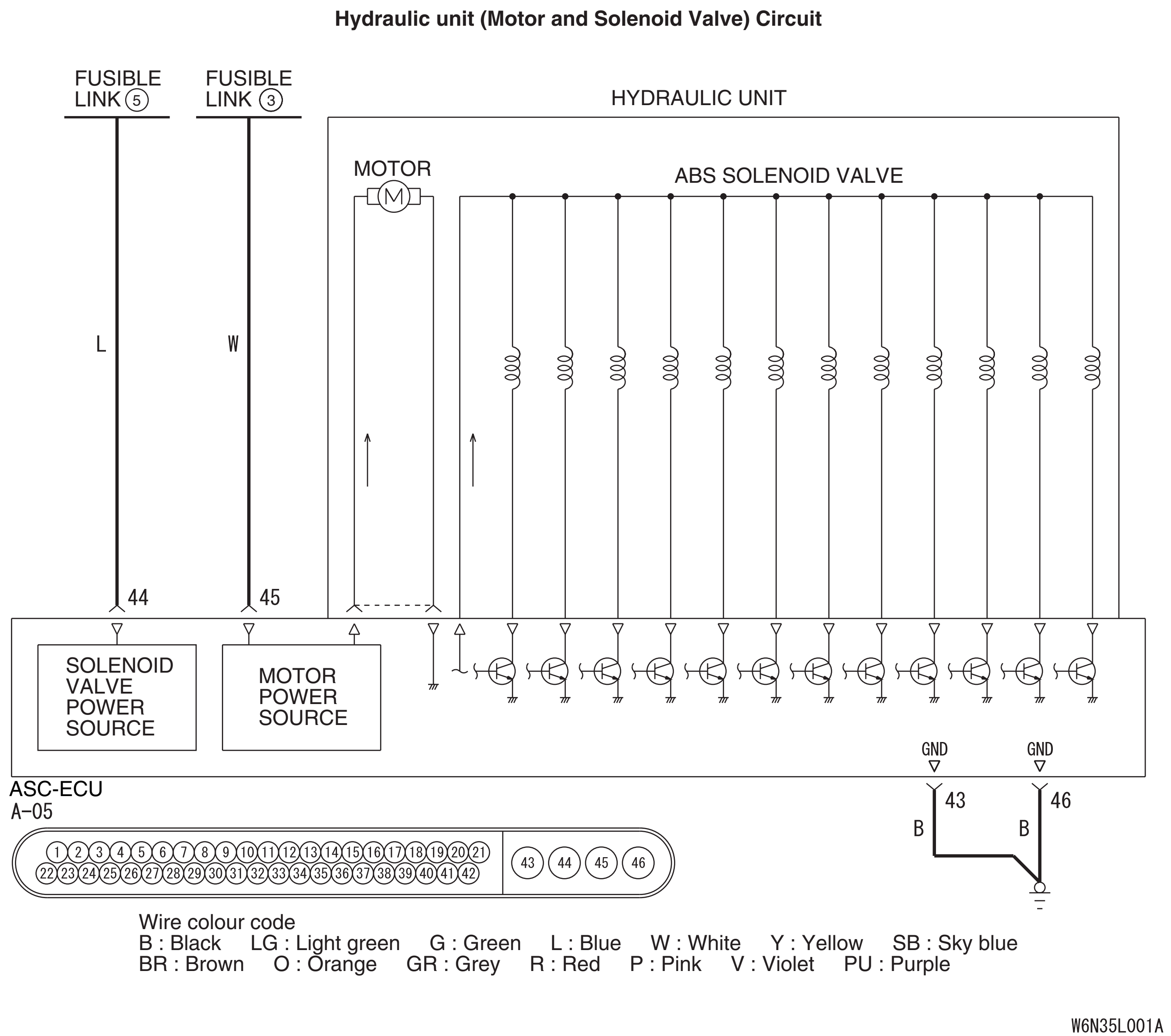
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1276 set?

YES : . Replace the ASC-ECU.

NO : . Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

Code No. C1278: Valve relay stuck OFF



> ⚠ **CAUTION**
> **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**

OPERATION

- ASC-ECU contains the power supply circuit (terminal No. 44) for the solenoid valve. The solenoid valve is energised by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is always energising the solenoid valve unless the initial check is in progress when the ignition switch is turned on, or the recurrent system check is in progress.

DIAGNOSIS CODE SET CONDITIONS

When the solenoid valve is not energised even after the valve relay is turned ON, the ECU determines that the valve relay stuck OFF and sets this diagnosis code.

PROBABLE CAUSES

Current trouble

- Damaged wiring harness and connectors
- The ABS-ECU is defective.

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Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the power supply circuit (terminal No. 44) to the ASC-ECU solenoid valve or earth circuit (terminal No. 46). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

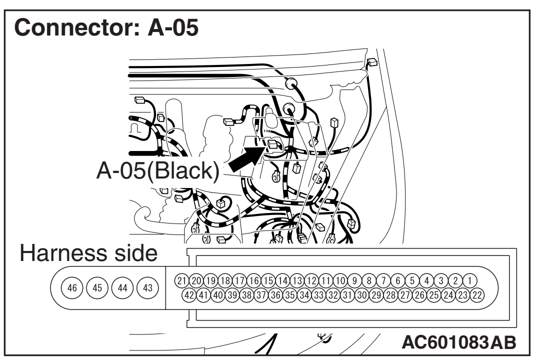
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1278 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

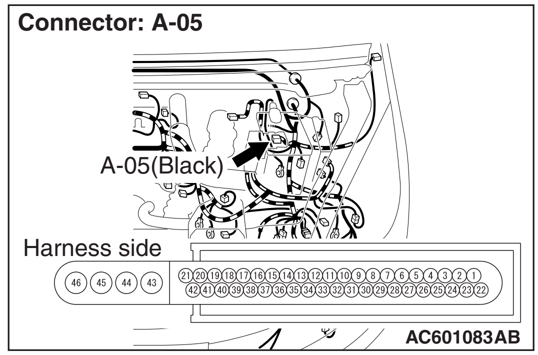
STEP 3. Connector check: A-05 ASC-ECU connector

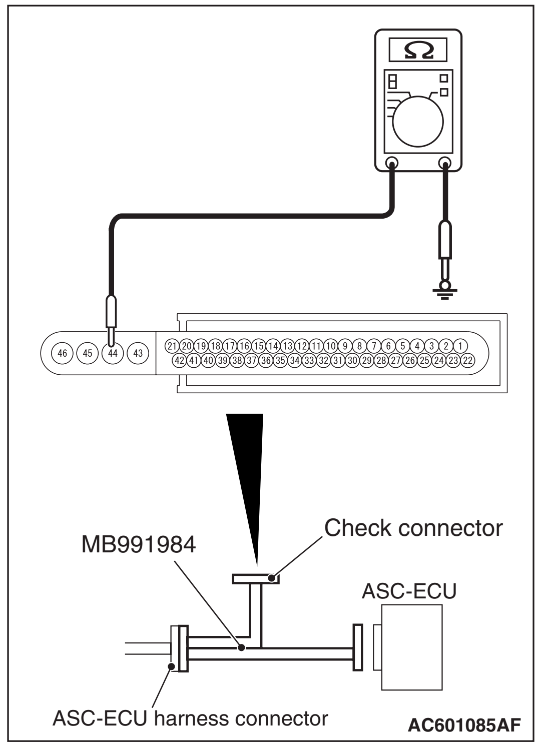


Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the damaged connector.

STEP 4. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the terminal No. 44 and the positive battery terminal.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring harness between the terminal No. 44 and the positive battery terminal.

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STEP 5. Diagnosis code recheck

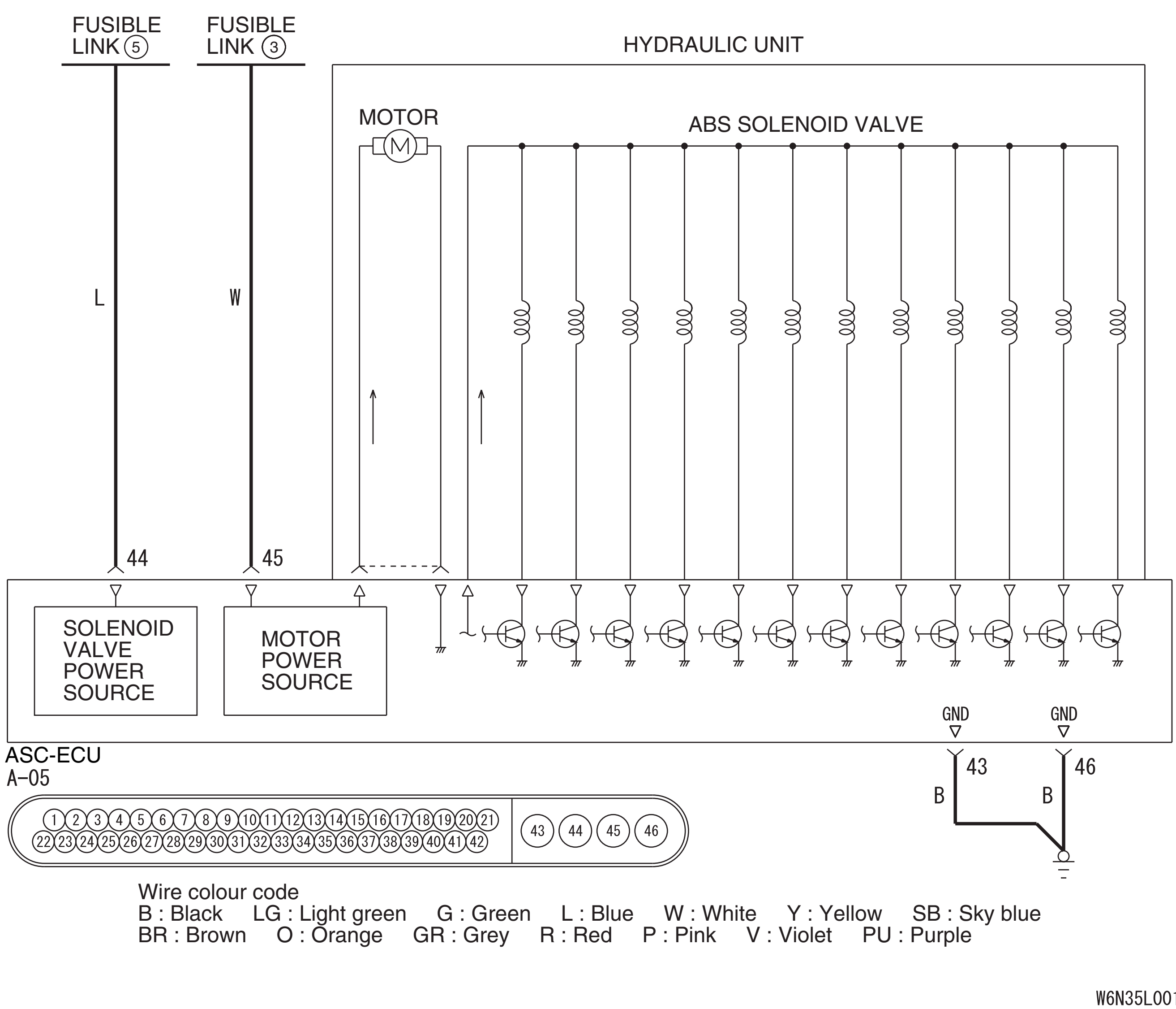
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1278 set?

YES : Replace the ASC-ECU.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

Code No. C1279: Valve relay stuck ON

Hydraulic unit (Motor and Solenoid Valve) Circuit



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

- ASC-ECU contains the power supply circuit (terminal No. 44) for the solenoid valve. The solenoid valve is energised by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is always energising the solenoid valve unless the initial check is in progress when the ignition switch is turned on, or the recurrent system check is in progress.

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DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the power supply voltage to the solenoid valve. If the solenoid valve is still energised even after the valve relay is turned OFF, the ECU determines that the motor relay stuck OFF, and sets this diagnosis code.

Current trouble

- Damaged wiring harness and connectors
- The ABS-ECU is defective.

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D − Troubleshooting P.54D-13.) On completion, go to Step 2.

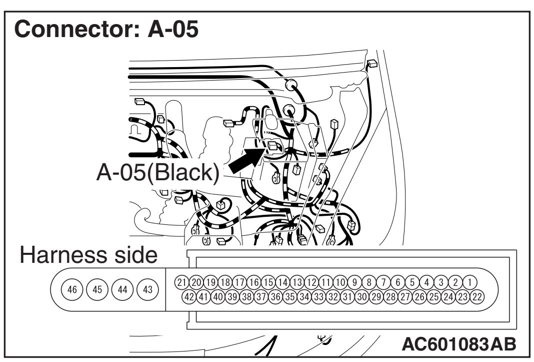
STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1279 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Connector check: A-05 ASC-ECU connector

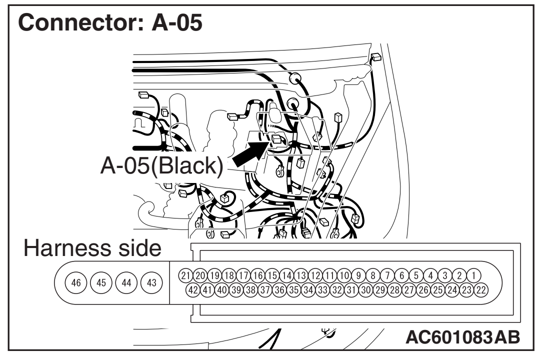


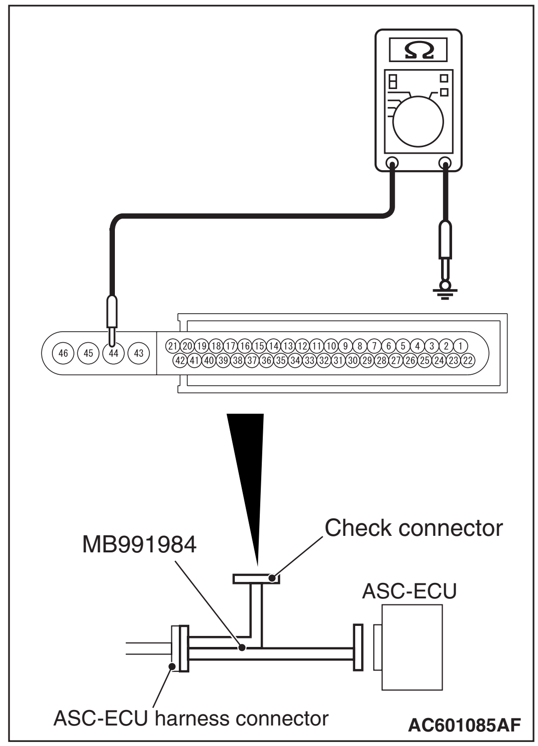
Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the damaged connector.

STEP 4. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the terminal No. 44 and the positive battery terminal.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the wiring harness between the terminal No. 44 and the positive battery terminal.

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STEP 5. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

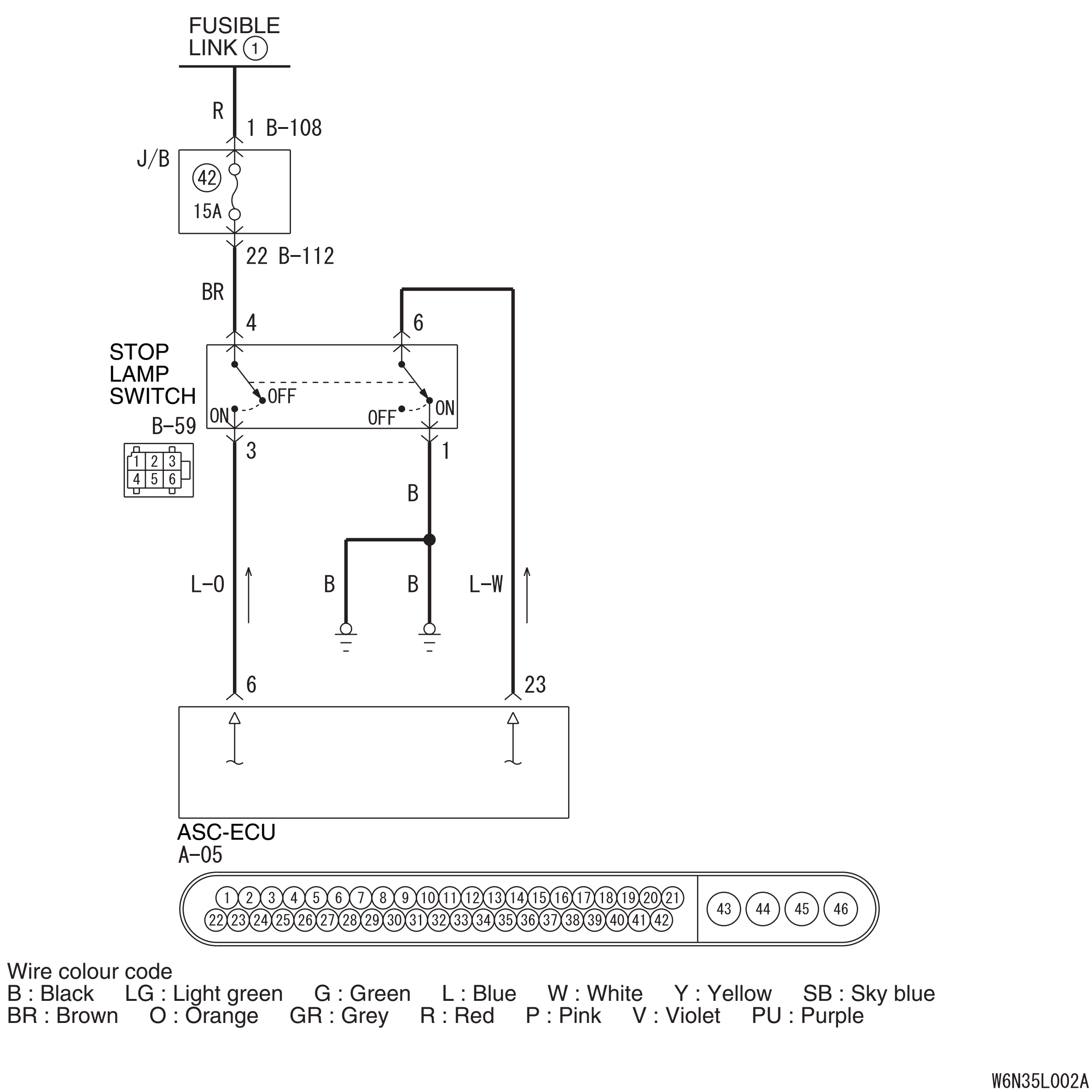
Q: Is the diagnosis code No. C1279 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

Code No. C1340: Stop lamp switch signal error

Stop Lamp Switch Circuit



> ⚠ **CAUTION**
> **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**

OPERATION

ASC-ECU determines that the brake is/is not applied based on the signals from 2-system stop lamp switch and pressure sensor (incorporated in ASC-ECU). If the signals from 2-system stop lamp switch and pressure sensor (incorporated in hydraulic unit) are differ, the ECU determines that the trouble occurs and sets the diagnosis code.

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DIAGNOSIS CODE SET CONDITIONS

If the signals from 2-system stop lamp switch and pressure sensor (incorporated in hydraulic unit) are differ, the ECU determines that the trouble occurs and sets the diagnosis code.

Current trouble

- Damaged wiring harness and connectors
- Malfunction of the stop lamp switch
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Connector check: B-27 Stop lamp switch connector

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the damaged connector.

STEP 3. Check of the stop lamp switch as single unit

Refer to GROUP 35A – Stop Lamp Switch Continuity P.35A-22.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the stop lamp switch.

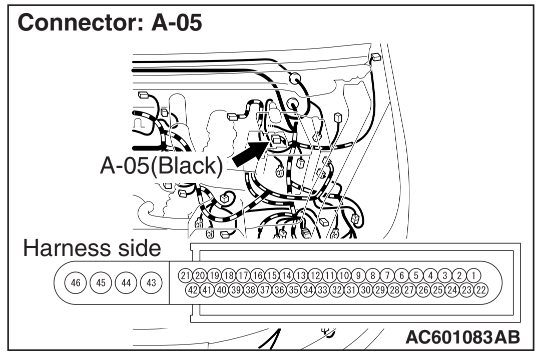
STEP 4. Connector check: A-05 ASC-ECU connector

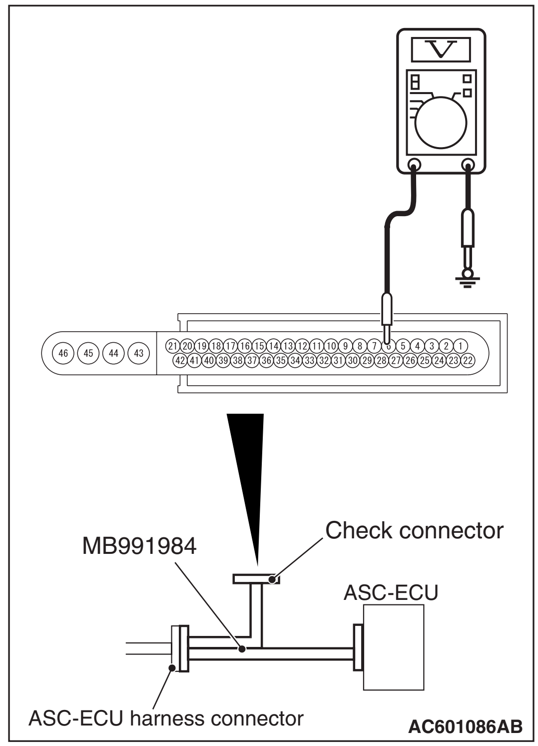
Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the damaged connector.

STEP 5. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ASC check harness (Special tool: MB991984) to the ABS-ECU side connector and harness-side connector, and then measure the voltage at the special tool connector side.
(2) Ignition switch: ON
(3) Measure the voltage between the terminal No. 6 and the body earth.

OK:
<When the brake pedal is not depressed> 2V or less
<When the brake pedal is depressed> 4.5V or more

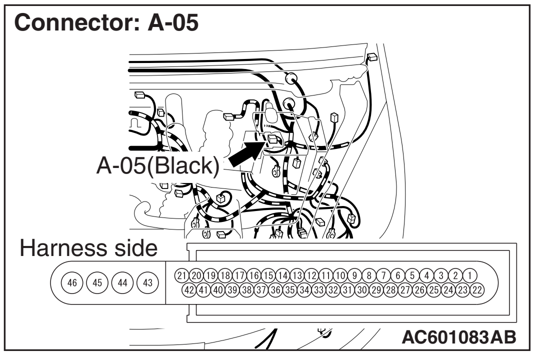
Q: Is the check result normal?

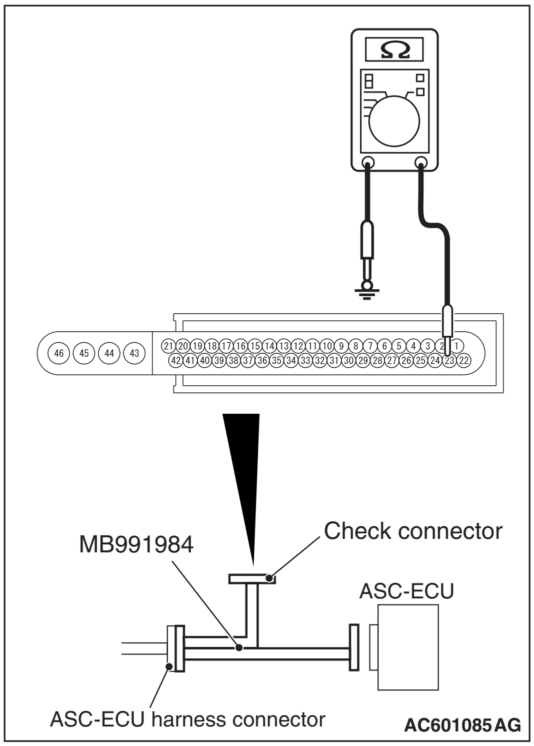
YES : Go to Step 6.

NO : Repair the wiring harness.

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STEP 6. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect A-05 ASC-ECU connector, connect the ABS check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: . Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the terminal No. 23 and the body earth.

OK:
<When the brake pedal is not depressed> Continuity (2V Ω or less)
<When the brake pedal is depressed> No continuity

Q: Is the check result normal?
YES : . Go to Step 7.
NO : Repair the wiring harness.

STEP 7. Diagnosis code recheck

Recheck if the diagnosis code is set.

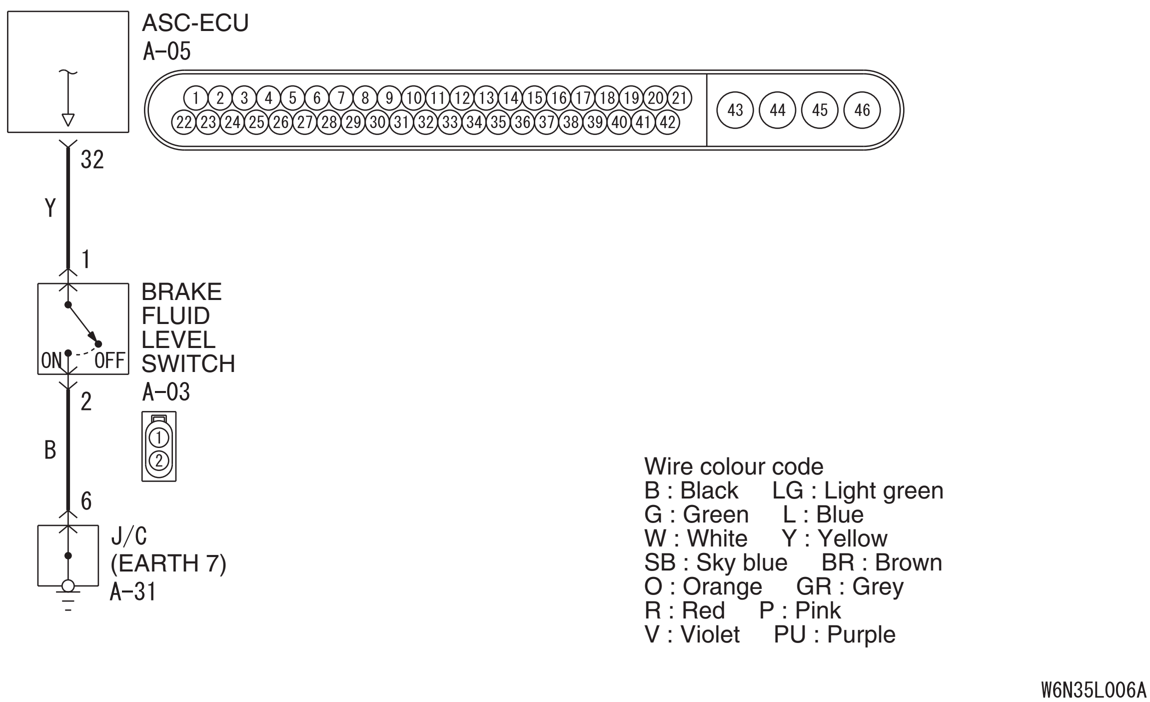
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON
(4) Depress the brake pedal for 2 seconds or more.

Q: Is the diagnosis code No. C1340 set?
YES : Replace the ASC-ECU.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. C1345: Low brake fluid level

Brake Fluid Level Switch Circuit



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

ASC-ECU monitors the brake fluid level by the brake fluid level switch signal.

DIAGNOSIS CODE SET CONDITIONS

When the brake fluid level is lower than the specified value, the brake fluid level switch is turned ON, the ASC-ECU terminal No. 32 is grounded, and then the ECU determines that the brake fluid level is low and sets this diagnosis code.

Current trouble

- Damaged wiring harness and connectors
- Low brake fluid level
- Long-time cornering in a certain direction (The brake fluid level is tilted by centrifugal force, and the low brake fluid level may be detected tempo-rarily.)
- Brake fluid level switch malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP2: Brake fluid level check

Check whether the brake fluid level is within the specified value.

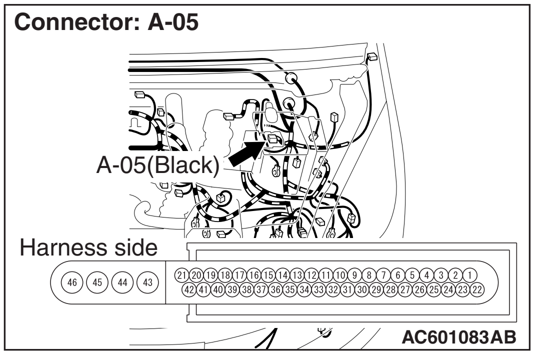
Q: Is the check result normal?

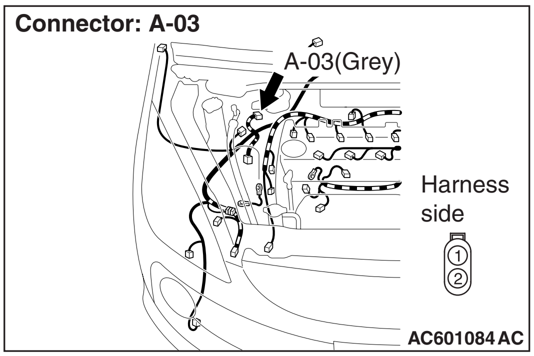
YES : Go to Step 3.

NO : Check the brake pad thickness and brake fluid line leakage.

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STEP 3. Connector check: A-05 ASC-ECU connector, A-03 brake fluid level switch connector



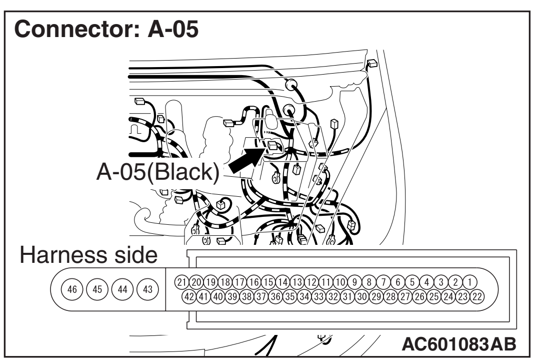


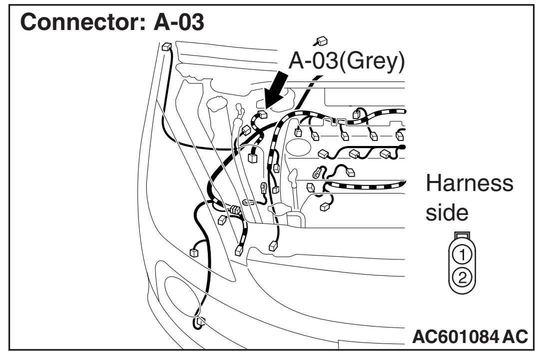
Q: Is the check result normal?

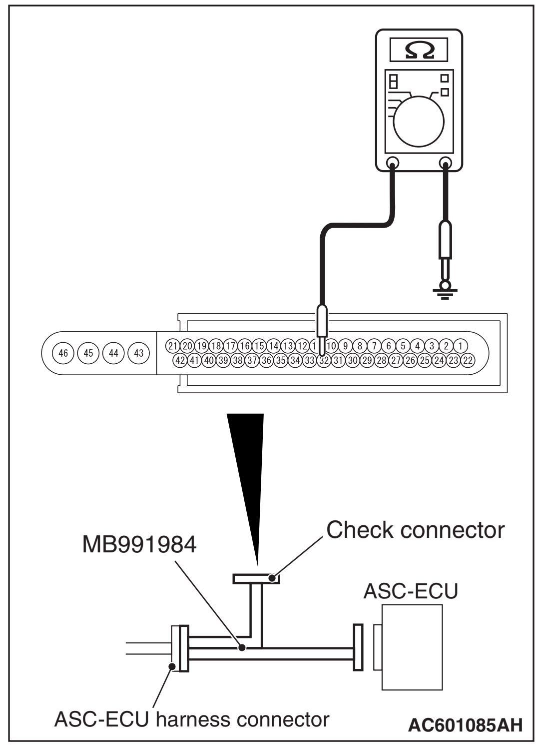
YES : Go to Step 4.

NO : Repair the damaged connector.

STEP 4. Resistance measurement: between A-05 ASC-ECU connector and A-03 brake fluid level switch connector







(1) Disconnect A-05 ASC-ECU connector and A-03 brake fluid level switch connector, and connect the ABS check harness (Special tool: MB991984) to the harness side connector.

NOTE: Do not connect the special tool to ASC-ECU.

(2) Resistance between the ABS check harness (Special tool: MB991984) connector terminal No. 32 and body earth

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 6.

NO : Go to Step 5.

STEP 5. Brake fluid level sensor check

Refer to GROUP 35A – Brake fluid level sensor check P.35A-11.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the brake fluid level sensor.

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STEP 6. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1345 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

Code No. C1364: Internal malfunction of pressure sensor

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

ASC-ECU incorporates the pressure sensor, and monitors the brake fluid pressure.

DIAGNOSIS CODE SET CONDITIONS

This diagnostic trouble codes will be set under the cases below:

- Pressure sensor power supply voltage malfunction
- Pressure sensor signal malfunction
- Abnormal result of initial check performed when the power is supplied to ASC-ECU.

Current trouble

- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Replace the ASC-ECU.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1364 set?

YES : Replace the ASC-ECU.

NO : This diagnosis is complete.

Code No. C1366: Lateral G-sensor signal error

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

The G and yaw rate sensor output signal is sent to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the G and yaw rate sensor output signal, and when an abnormality is present in the signal from the G and yaw rate sensor, the ECU determines that the trouble occurs and sets the diagnosis code.

Current trouble

- G and yaw rate sensor malfunction
- G and yaw rate sensor improper installation
- Driving under special conditions (bad road, etc.)
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1366 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

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STEP 3. G and yaw rate sensor installation state check

Check that the G and yaw rate sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Reinstall the G and yaw rate sensor correctly.

STEP 4. M.U.T.-III data list

Check the following service data. (Refer to P.35C-109.)

- Item No. 14: Lateral G-sensor

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the G and yaw rate sensor, and then go to Step 6.

STEP 5. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1366 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

STEP 6. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1366 set?

YES : Replace the ASC-ECU.

NO : This diagnosis is complete.

Code No. C1371: Yaw rate sensor signal error

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

The G and yaw rate sensor output signal is sent to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the G and yaw rate sensor output signal, and when an abnormality is present in the signal from the G and yaw rate sensor, the ECU determines that the trouble occurs and sets the diagnosis code.

Current trouble

- G and yaw rate sensor malfunction
- G and yaw rate sensor improper installation
- Driving under special conditions (bad road, etc.)
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1371 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. G and yaw rate sensor installation state check

Check that the G and yaw rate sensor is installed correctly (not tilted).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Reinstall the G and yaw rate sensor correctly.

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STEP 4. M.U.T.-III data list

Check the following service data.(Refer to P.35C-109.)

- Item No.17: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the G and yaw rate sensor, and then go to Step 6.

STEP 5. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1371 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

STEP 6. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1371 set?

YES : Replace the ASC-ECU.

NO : This diagnosis is complete.

Code No. C1385: Yaw rate sensor error

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

The G and yaw rate sensor output signal is sent to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

If an abnormality is judged to have occurred in the G and yaw rate sensor, the G and yaw rate sensor sends a diagnostic signal to ASC-ECU. When ASC-ECU receives this diagnostic signal, it determines that the sensor has a trouble and sets the diagnosis code.

Current trouble

- G and yaw rate sensor malfunction
- Driving under special conditions (bad road, etc.)
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1385 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. G and yaw rate sensor installation state check

Check that the G and yaw rate sensor is installed correctly (not tilted).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Reinstall the G and yaw rate sensor correctly.

STEP 4. M.U.T.-III data list

Check the following service data.(Refer to P.35C-109.)

- Item No.17: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the G and yaw rate sensor, and then go to Step 6.

STEP 5. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

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Q: Is the diagnosis code No. C1385 set?
- **YES :** Replace the ASC-ECU.
- **NO :** Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

STEP 6. Diagnosis code recheck
(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1385 set?
- **YES :** Replace the ASC-ECU.
- **NO :** This diagnosis is complete.

Code No. C1387: Lateral G-sensor error

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION
The G and yaw rate sensor output signal is sent to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS
If an abnormality is judged to have occurred in the G and yaw rate sensor, the G and yaw rate sensor sends a diagnostic signal to ASC-ECU. When ASC-ECU receives this diagnostic signal, it determines that the sensor has a trouble and sets the diagnosis code.

Current trouble
- G and yaw rate sensor malfunction
- Driving under special conditions (bad road, etc.)
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
- **YES :** Go to Step 3.
- **NO :** Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1387 set?
- **YES :** Go to Step 3.
- **NO :** This diagnosis is complete.

STEP 3. G and yaw rate sensor installation state check
Check that the G and yaw rate sensor is installed correctly (not tilted).

Q: Is the check result normal?
- **YES :** Go to Step 4.
- **NO :** Reinstall the G and yaw rate sensor correctly.

STEP 4. M.U.T.-III data list
Check the following service data.(Refer to P.35C-109.)
- Item No. 14: Lateral G-sensor

Q: Is the check result normal?
- **YES :** Go to Step 5.
- **NO :** Replace the G and yaw rate sensor, and then go to Step 6.

STEP 5. Diagnosis code recheck
(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1387 set?
- **YES :** Replace the ASC-ECU.
- **NO :** Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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STEP 6. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1387 set?

YES : Replace the ASC-ECU.
NO : This diagnosis is complete.

Code No. C1388: Yaw rate sensor active check error

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

The G and yaw rate sensor output signal is sent to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the G and yaw rate sensor output signal, and when an abnormality is present in the signal from the G and yaw rate sensor, the ECU determines that the trouble occurs and sets the diagnosis code.

Current trouble

- G and yaw rate sensor malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1371 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III data list

Check the following service data.(Refer to P.35C-109.)

- Item No.17: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the G and yaw rate sensor, and then go to Step 5.

STEP 4. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1388 set?

YES : Replace the ASC-ECU.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

STEP 5. Diagnosis code recheck

(1) Ignition switch: ON
(2) Erase the diagnosis code.
(3) Ignition switch: LOCK (OFF) position
(4) Start the engine.
(5) Drive the vehicle at 40 km/h or more.

Q: Is the diagnosis code No. C1388 set?

YES : Replace the ASC-ECU.
NO : This diagnosis is complete.

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Code No. C1394: Steering wheel sensor neutral point not learned

OPERATION

The steering wheel sensor output signal is sent to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU receives the information of the steering wheel sensor calibration from the steering wheel sensor. When this information indicates that the calibration is not performed, the ECU sets the diagnosis code.

PROBABLE CAUSES

- Steering wheel sensor calibration not implemented
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III data list

Check the following service data.(Refer to P.35C-109.)

- Item No. 30: SAS calibration flag

Q: Is the check result normal?

YES : Go to Step 2.

NO : Perform calibration of steering wheel sensor.(Refer to P.35C-119.) Then go to Step 2.

STEP 2. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

(2) Ignition switch: LOCK (OFF) position

(3) Ignition switch: ON

Q: Is the diagnosis code No. C1394 set?

YES : Replace the ASC-ECU.

NO : This diagnosis is complete.

Code No. C1396: Engine torque intervention rejection

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

ASC-ECU receives the engine system-related signal from the engine ECU via CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

When the torque request rejection signal from the engine ECU indicates the rejection state, ASC-ECU determines that the trouble occurs and sets this diagnosis code.

Current trouble

- Engine ECU malfunction
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1396 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code for other systems

Check that the engine ECU sets a diagnosis code.

Q: Is the diagnosis code set?

YES : Go to Step 4.

NO : Troubleshoot the engine-ECU. (Refer to GROUP 13B – Troubleshooting P.13B-18.)

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STEP 4. M.U.T.-III diagnosis code

Check if the diagnosis code other than the code No. C1396 is set from ASC-ECU.

Q: Is the diagnosis code other than the code No. C1396 set?

YES : Troubleshoot for the relevant diagnosis code. (Refer to P.35C-6.)

NO : Replace the engine ECU. Then go to Step 5.

STEP 5. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1396 set?

YES : Replace the ASC-ECU.

NO : This diagnosis is complete.

Code No. C1505: Steering wheel sensor error

OPERATION

The steering wheel sensor output signal is sent to ASC-ECU via the dedicated CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the signal from the steering wheel sensor, when an abnormal signal is output from the steering wheel sensor, the ECU determines that the trouble occurs and sets the diagnosis code.

PROBABLE CAUSES

- Steering wheel sensor malfunction
- Steering wheel sensor improper installation
- Steering wheel sensor calibration error
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III data list

With the front wheel facing in the straight-ahead direction, check the steering wheel sensor signal using the data list. Check that the data list shows the deviation within ±5° from the neutral position.(Refer to P.35C-109.)

- Item No. 16: Steering angle sensor

Q: Is the check result normal?

YES : Go to Step 2.

NO : Perform calibration of steering wheel sensor.(Refer to P.35C-119.)

STEP 2. Steering wheel sensor installation state check

Check that the steering wheel sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Install the steering wheel sensor correctly.

STEP 3. M.U.T.-III data list

Turn the steering wheel fully to the left, and then turn it fully to the right. Then check that the value of the steering wheel sensor changes smoothly using the data list. In addition, check that the steering wheel angle on the data list almost matches the actual steering wheel angle.(Refer to P.35C-109.)

- Item No. 16: Steering angle sensor

Q: Is the check result normal?

YES : Go to Step 4.

NO : After the steering wheel is replaced, perform the steering wheel sensor calibration.(Refer to P.35C-119.)

STEP 4. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is diagnosis code No. C1505 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. C1555: Steering wheel sensor exceeding the normal range

OPERATION

The steering wheel sensor output signal is sent to ASC-ECU via the dedicated CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

When an abnormality (larger than the actual maximum steering angle) is detected in the steering angle, the diagnosis is set.

PROBABLE CAUSES

- Steering wheel sensor malfunction
- Steering wheel sensor improper installation
- Steering wheel sensor calibration error
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III data list

With the front wheel facing in the straight-ahead direction, check the steering wheel sensor signal using the data list. Check that the data list shows the deviation within ±5° from the neutral position.(Refer to P.35C-109.)

- Item No. 16: Steering angle sensor

Q: Is the check result normal?

YES : Go to Step 2.

NO : Perform calibration of steering wheel sensor.(Refer to P.35C-119.)

STEP 2. Steering wheel sensor installation state check

Check that the steering wheel sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Install the steering wheel sensor correctly.

STEP 3. M.U.T.-III data list

Turn the steering wheel fully to the left, and then turn it fully to the right. Then check that the value of the steering wheel sensor changes smoothly using the data list. In addition, check that the steering wheel angle on the data list almost matches the actual steering wheel angle.(Refer to P.35C-109.)

- Item No. 16: Steering angle sensor

Q: Is the check result normal?

YES : Go to Step 4.

NO : After the steering wheel is replaced, perform the steering wheel sensor calibration.(Refer to P.35C-119.)

STEP 4. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is diagnosis code No. C1505 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

Code No. C1607: Malfunction of ASC-ECU

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

When an abnormality is present in the internal ASC-ECU, this diagnosis code is set.

PROBABLE CAUSES

ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

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STEP 2. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1607 set?

YES : Replace the ASC-ECU.
NO : This diagnosis is complete.

Code No. C1621: G and yaw rate sensor improper installation

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

ASC-ECU automatically recognises the type of G and yaw rate sensor via the CAN bus lines. If another type of G and yaw rate sensor is installed after automatic recognition, this code is stored.

DIAGNOSIS CODE SET CONDITIONS

If an abnormality is judged to have occurred in the G and yaw rate sensor, the G and yaw rate sensor sends a diagnostic signal to ASC-ECU. When ASC-ECU receives this diagnostic signal, it determines that the sensor has a trouble and sets the diagnosis code.

Current trouble

- Another type G and yaw rate sensor installation
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1621 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Diagnosis code recheck

Check if the diagnosis code No. C1621 is set as a past trouble.

Q: Is the trouble set as a past trouble?

YES : Erase the diagnosis code No. C1621.
NO : Go to Step 4.

STEP 4. Diagnosis code recheck after sensor ID erase execution

(1) Erase the sensor ID.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON
(4) Erase the diagnosis code.

Q: Is the diagnosis code No. C1621 set?

YES : Replace the G and yaw rate sensor, and then go to Step 5.
NO : This diagnosis is complete.

STEP 5. Diagnosis code recheck after sensor ID erase execution

(1) Erase the sensor ID.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON
(4) Erase the diagnosis code.

Q: Is the diagnosis code No. C1621 set?

YES : Replace the ASC-ECU, and then go to Step 6.
NO : This diagnosis is complete.

STEP 6. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1621 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

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Code No. C1860: Abnormal rise of ASC-ECU power supply voltage

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the ASC-ECU power supply voltage sent from the battery. When the voltage rises up to approximately 17 V or more, the ECU determines that the trouble occurs and sets the diagnosis code.

Current trouble

- Charging circuit failure
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1860 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Battery terminal voltage measurement

(1) Start the engine.

(2) Set the engine speed to approximately 2500 rpm.

(3) Measure the voltage between the positive and negative battery terminals.

OK: 16 V or less

Q: Is the check result normal?

YES : Go to Step 4.

NO : Diagnose the charging system. (Refer to GROUP 16 – On-vehicle Service P.16-6.)

STEP 4. Diagnosis code recheck

(1) Start the engine.

(2) Set the engine speed to approximately 2500 rpm.

Q: Is the diagnosis code No. C1860 set?

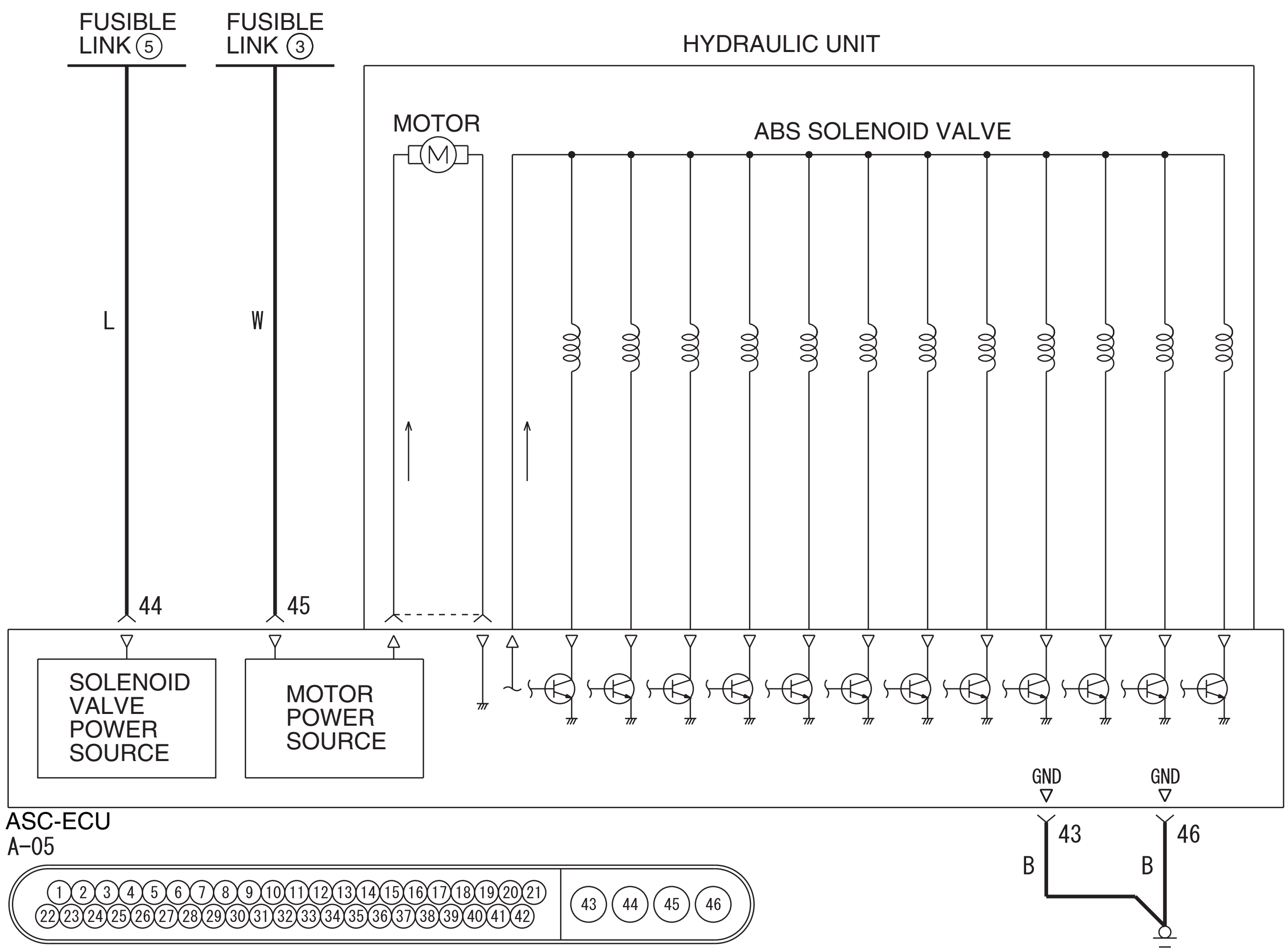
YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. C1861: Abnormal drop of ASC-ECU power supply voltage

Hydraulic unit (Motor and Solenoid Valve) Circuit



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the ASC-ECU power supply voltage sent from the battery. When the voltage is approximately 8 V or less at the vehicle speed of 6 km/h, the ECU determines that the trouble occurs and sets the diagnosis code.

Current trouble

- Damaged wiring harness and connectors
- Charging circuit failure
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D − Troubleshooting P.54D-13.) On completion, go to Step 2.

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STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1861 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Battery terminal voltage measurement

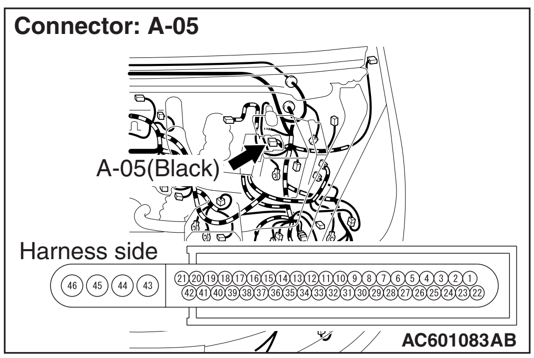
(1) Start the engine.
(2) Measure the voltage between the positive and negative battery terminals.

OK: 10 V or more

Q: Is the check result normal?

YES : Go to Step 4.
NO : Diagnose the charging system. (Refer to GROUP 16 – On-vehicle Service P.16-6.)

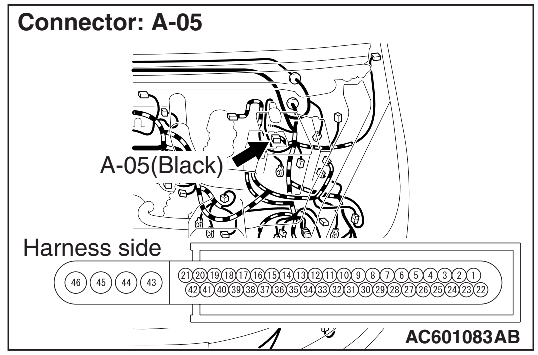
STEP 4. Connector check: A-05 ASC-ECU connector

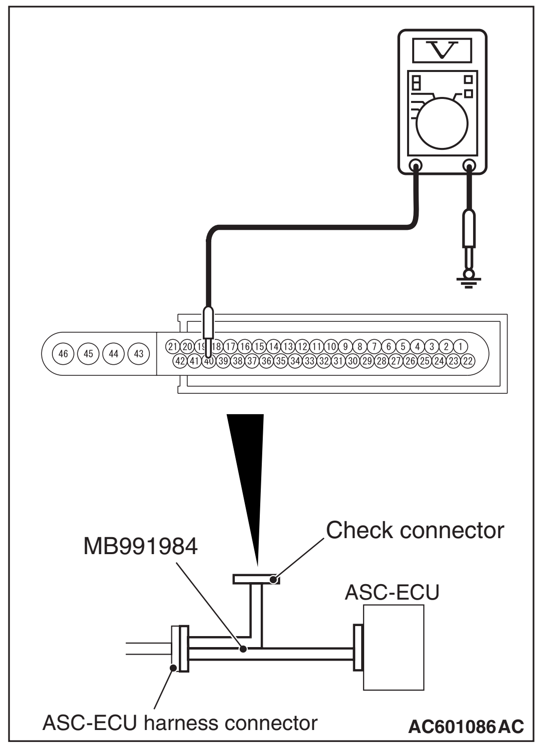


Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the damaged connector.

STEP 5. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect the connector, connect the ASC check harness (Special tool: MB991984) to the ASC-ECU side connector and harness-side connector, and then measure the voltage at the special tool connector side.
(2) Start the engine.
(3) Measure the voltage between the terminal No. 40 and the body earth.

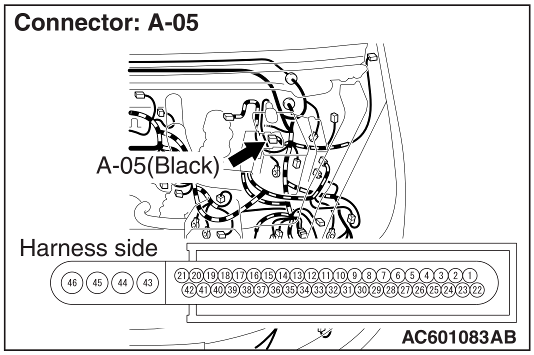
OK: 10 V or more

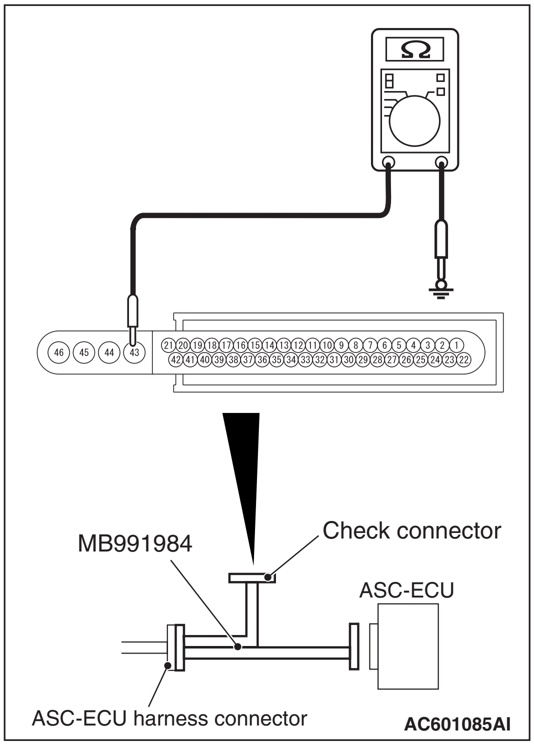
Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the wiring harness.

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STEP 6. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the connector, connect the ASC check harness (Special tool: MB991984) to the harness-side connector, and measure the voltage at the special tool connector side.

NOTE: . Do not connect the special tool to ASC-ECU.

(2) Measure the resistance between the terminal No. 43 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : . Go to Step 7.

NO : . Repair the wiring harness.

STEP 7. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Start the engine.
(4) Drive the vehicle at 6 km/h or more.

Q: Is the diagnosis code No. C1861 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. C1862: Abnormal power supply voltage of G and yaw rate sensor (high voltage)

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

The G and yaw rate sensor monitors the G and yaw rate sensor power supply voltage supplied from the battery. When the voltage rises up to approximately 17 V or more, the sensor determines that the trouble occurs and sets the diagnosis code.

Current trouble

- Charging circuit failure
- G and yaw rate sensor malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1862 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Battery terminal voltage measurement

(1) Start the engine.
(2) Set the engine speed to approximately 2500 rpm.
(3) Measure the voltage between the positive and negative battery terminals.

OK: 16 V or less

Q: Is the check result normal?

YES : Go to Step 4.

NO : Diagnose the charging system. (Refer to GROUP 16 – On-vehicle Service P.16-6.)

STEP 4. Diagnosis code recheck

(1) Start the engine.
(2) Set the engine speed to approximately 2500 rpm.

Q: Is the diagnosis code No. C1862 set?

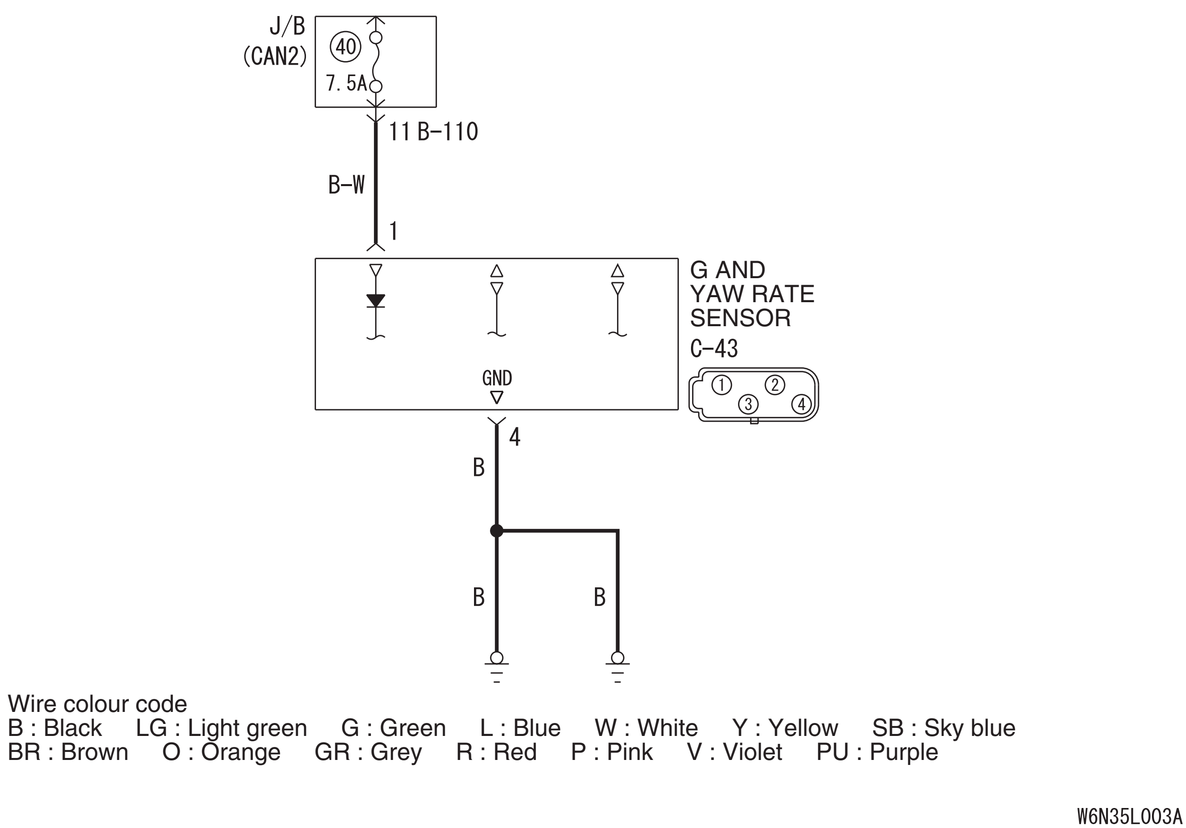
YES : Replace the G and yaw rate sensor.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. C1863: Abnormal power supply voltage of G and yaw rate sensor (low voltage)

G and Yaw Rate Sensor Power Source Circuit



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

The G and yaw rate sensor monitors the G and yaw rate sensor power supply voltage supplied from the battery. When the voltage drops to approximately 8 V or less, the sensor determines that the trouble occurs and sets the diagnosis code.

Current trouble

- Damaged wiring harness and connectors
- Charging circuit failure
- G and yaw rate sensor malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1863 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

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STEP 3. Battery terminal voltage measurement

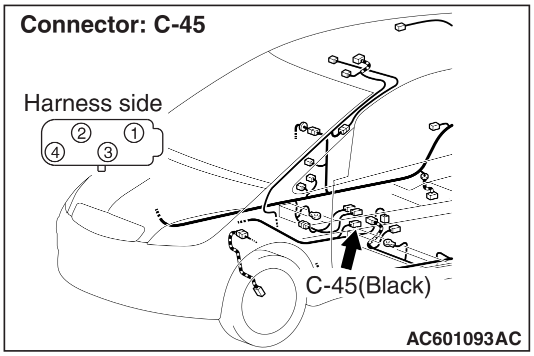
(1) Start the engine.
(2) Measure the voltage between the positive and negative battery terminals.

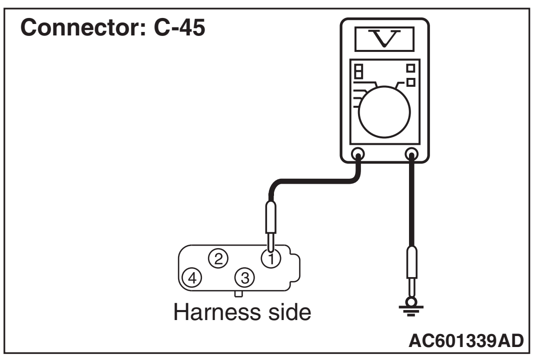
OK: 10 V or more

Q: Is the check result normal?

YES : Go to Step 4.
NO : Diagnose the charging system. (Refer to GROUP 16 – On-vehicle Service P.16-6.)

STEP 4. Measure the voltage at C-45 G and yaw rate sensor connector.





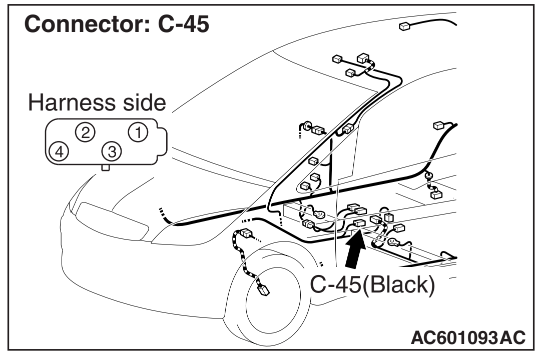
(1) Disconnect C-45 G and yaw rate sensor connector, and measure at the harness side.
(2) Measure the voltage between the terminal No. 1 and the body earth.

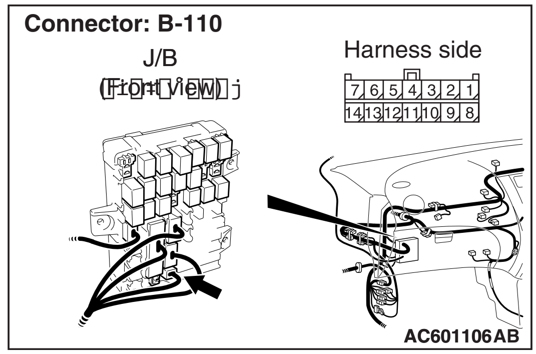
OK: 9 V or more

Q: Is the check result normal?

YES : . Go to Step 7.
NO : . Go to Step 5.

STEP 5. Connector check: C-45 G and yaw rate sensor connector, B-110 junction block connector



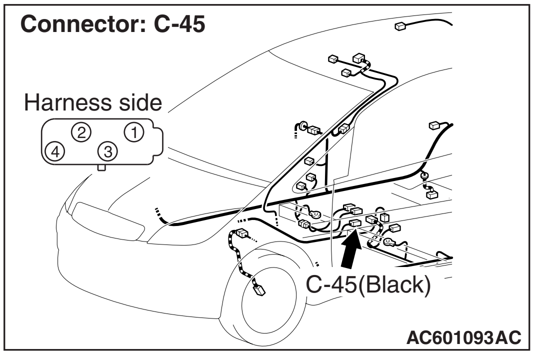


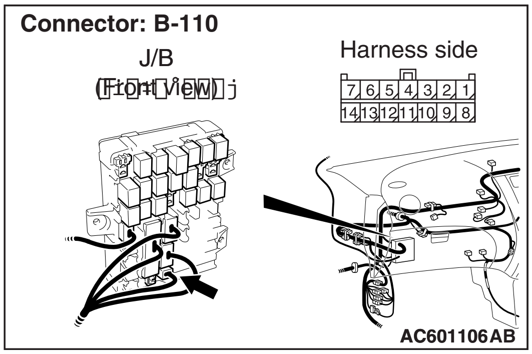
Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the damaged connector.

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STEP 6. Check the harness wire between C-45 G and yaw rate sensor connector and B-110 junction block connector.



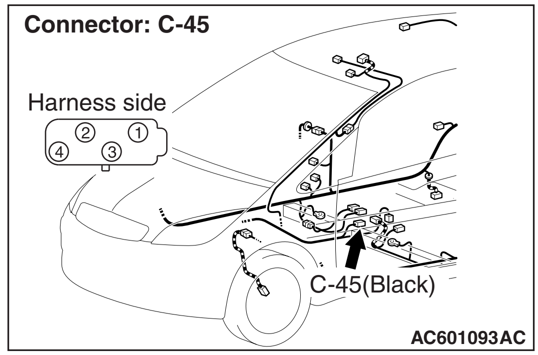


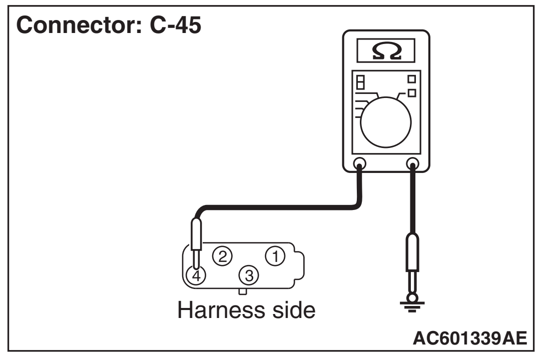
Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the wiring harness.

STEP 7. Measure the resistance at C-45 G and yaw rate sensor connector.





(1) Disconnect C-45 G and yaw rate sensor connector, and measure at the harness side.
(2) Measure the resistance between the terminal No. 4 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 8.

NO : Repair the wiring harness.

STEP 8. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. C1863 set?

YES : Replace the G and yaw rate sensor.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. U1073: Bus-off

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

When ASC-ECU has ceased the CAN communication (bus-off), the diagnosis code No. U1073 is stored. The communication is resumed when the ignition switch is tuned to the "LOCK" (OFF) position and then to ON position again.

Probable causes

- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

M.U.T.-III CAN bus diagnosis
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.)

Code No. U1100: Engine-related CAN time-out error

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU receives the engine control system-related signals from the engine ECU via the CAN bus lines. When these signals cannot be received, the ECU stores the diagnosis code No. U1100.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ASC-ECU and the engine-ECU, the power supply system to the engine-ECU, or the ASC-ECU itself may be defective.

Past trouble

- If diagnosis code No. U1100 is stored as a past trouble, carry out diagnosis with particular emphasis on connector(s) and wiring harness in the CAN bus line between the ASC-ECU and the engine ECU, and the power supply system to ASC-ECU. For diagnosis procedures, refer to How to treat past trouble (refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-13).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54D – CAN Bus Line Diagnostic Flow P.54D-7).

Probable causes

- Engine ECU malfunction
- ASC-ECU malfunction
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. U1100 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

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STEP 3. M.U.T.-III diagnosis code for other systems

Use M.U.T.-III to check that other diagnosis code is set in the ECU corresponding to the relevant diagnosis code.

Q: Is other diagnosis code set?

YES : Troubleshoot for the relevant diagnosis code.

NO : Replace the engine ECU. Then go to Step 4.

STEP 4. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. U1100 set?

YES : Replace the ASC-ECU.

NO : This diagnosis is complete.

Code No. U1104: Steering wheel sensor CAN time-out error

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU receives the steering angle-related signals from the steering wheel sensor via the CAN bus lines. When these signals cannot be received, the diagnosis code No. U1104 is stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- The connector(s) or wiring harness in the CAN bus line between ASC-ECU and the steering wheel sensor may be damaged, or the steering wheel sensor power supply circuit or ASC-ECU may be faulty.

Past trouble

- If diagnosis code No. U1104 is stored as a past trouble, carry out diagnosis with particular emphasis on connector(s) and wiring harness in the CAN bus line between the ASC-ECU and the steering wheel sensor, and the steering wheel sensor power supply circuit. For diagnosis procedures, refer to How to treat past trouble (refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-13).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs. (Refer to GROUP 54D – CAN Bus Line Diagnostic Flow P.54D-7.)

Probable causes

- Steering wheel sensor malfunction
- ASC-ECU malfunction
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. U1104 set?

YES : Replace the steering wheel sensor.(Refer to P.35C-125.) Then go to Step 3.

NO : This diagnosis is complete.

STEP 3. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. U1104 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. U1105: G and yaw rate sensor CAN time-out error

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU receives the steering angle-related signals from the G and yaw rate sensor via the CAN bus lines. When these signals cannot be received, the diagnosis code No. U1105 is stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- The connector(s) or wiring harness in the CAN bus line between ASC-ECU and the G and yaw rate sensor may be damaged, or the G and yaw rate sensor power supply circuit or ASC-ECU may be faulty.

Past trouble

- If diagnosis code No. U1105 is stored as a past trouble, carry out diagnosis with particular emphasis on connector(s) and wiring harness in the CAN bus line between the ASC-ECU and the G and yaw rate sensor, and the G and yaw rate sensor power supply circuit. For diagnosis procedures, refer to How to treat past trouble (refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-13).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs. (Refer to GROUP 54D – CAN Bus Line Diagnostic Flow P.54D-7.)

Probable causes

- G and yaw rate sensor malfunction
- ASC-ECU malfunction
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. U1105 set?

YES : Replace the G and yaw rate sensor, and then go to Step 3.

NO : This diagnosis is complete.

STEP 3. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

(2) Ignition switch: LOCK (OFF) position

(3) Ignition switch: ON

Q: Is the diagnosis code No. U1105 set?

YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Code No. U1406: Acceleration pedal position signal error

⚠ **CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU receives the engine control system-related signals from the engine ECU via the CAN bus lines. When the information on trouble is included in these signals, this diagnosis code is stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ASC-ECU and the engine-ECU, the power supply system to the engine-ECU, or the ASC-ECU itself may be defective.

Past trouble

- If diagnosis code No. U1406 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the ASC-ECU and the engine-ECU, and the power supply system to the engine-ECU. For diagnosis procedures, refer to How to treat past trouble (refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-13).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs. (Refer to GROUP 54D – CAN Bus Line Diagnostic Flow P.54D-7.)

Probable causes

- Engine ECU malfunction
- ASC-ECU malfunction
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. U0406 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code for other systems

Use M.U.T.-III to check that the diagnosis code is set in the other systems.

Q: Is the diagnosis code set?

YES : Troubleshoot for the relevant diagnosis code.
NO : Replace the engine ECU, and then go to Step 4.

STEP 4. Diagnosis code recheck

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. U0406 set?

YES : Replace the ASC-ECU.
NO : This diagnosis is complete.

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Code No. U1426: Engine speed signal error

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU receives the engine speed-related signals from the engine ECU via the CAN bus lines. When the information on trouble is included in these signals, this diagnosis code is stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ASC-ECU and the engine-ECU, the power supply system to the engine-ECU, or the ASC-ECU itself may be defective.

Past trouble

- If diagnosis code No. U1426 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the ASC-ECU and the engine-ECU, and the power supply system to the engine-ECU. For diagnosis procedures, refer to How to treat past trouble (refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-13).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs. (Refer to GROUP 54D – CAN Bus Line Diagnostic Flow P.54D-7.)

Probable causes

- Engine ECU malfunction
- ASC-ECU malfunction
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. U1426 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code for other systems

Use M.U.T.-III to check that the diagnosis code is set in the other systems.

Q: Is the diagnosis code set?
YES : Troubleshoot for the relevant diagnosis code.
NO : Replace the engine ECU, and then go to Step 4.

STEP 4. Diagnosis code recheck

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. U1426 set?
YES : Replace the ASC-ECU.
NO : This diagnosis is complete.

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Code No. U1427: Engine torque signal error
Code No. U1428: Engine's maximum torque signal error
Code No. U1429: Engine's minimum torque signal error
Code No. U1430: Engine's torque request signal error

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU receives the engine torque-related signals from the engine ECU via the CAN bus lines. When the information on trouble is included in these signals, this diagnosis code is stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ASC-ECU and the engine-ECU, the power supply system to the engine-ECU, or the ASC-ECU itself may be defective.

Past trouble

- If diagnosis code No. U1427, U1428, U1429, or U1430 is stored as a past trouble, carry out diagnosis with particular emphasis on connector(s) and wiring harness in the CAN bus line between the ASC-ECU and the engine ECU, and the power supply circuit to the engine ECU. For diagnosis procedures, refer to How to treat past trouble (refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-13).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points P.00-13 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs. (Refer to GROUP 54D – CAN Bus Line Diagnostic Flow P.54D-7.)

Probable causes

- Engine ECU malfunction
- ASC-ECU malfunction
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. U1427, U1428, U1429, or U1430 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code for other systems

Use M.U.T.-III to check that the diagnosis code is set in the other systems.

Q: Is the diagnosis code set?
YES : Troubleshoot for the relevant diagnosis code.
NO : Replace the engine ECU, and then go to Step 4.

STEP 4. Diagnosis code recheck

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) position
(3) Ignition switch: ON

Q: Is the diagnosis code No. U1427, U1428, U1429, or U1430 set?
YES : Replace the ASC-ECU.
NO : This diagnosis is complete.

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TROUBLE SYMPTOM CHART

M1357001000013

⚠ CAUTION

During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, check if the diagnosis code is set. If the diagnosis code has been set, erase that code.

Trouble symptom	Inspection procedure number	Reference page
Cannot communicate with ASC-ECU using the M.U.T.-III	1	P.35C-85
ASC-ECU power supply circuit system	2	P.35C-86
The ABS warning lamp and the ASC indicator lamp don't illuminate when the ignition switch is turned ON.	3	P.35C-89
ABS warning lamp and ASC indicator lamp does not extinguish after the engine is started.	4	P.35C-90
Brake warning lamp does not illuminate at all.	5	P.35C-91
Brake warning lamp does not illuminate when the parking brake is operated. (illuminates when the bulb check is performed.)	6	P.35C-92
Brake warning lamp does not illuminate when the brake fluid level is low (illuminates when the parking brake is operated).	7	P.35C-94
Brake warning lamp does not extinguish when the ignition switch is ON (remains illuminated).	8	P.35C-96
Stability control system operates too frequently (no diagnosis code is set).	9	P.35C-100
Steering wheel sensor power supply system	10	P.35C-102
G and yaw rate sensor power supply circuit	11	P.35C-105

SYMPTOM PROCEDURES

Inspection Procedure 1: Cannot communicate with ASC-ECU using the M.U.T.-III

COMMENTS ON TROUBLE SYMPTOM

If the M.U.T.-III cannot communicate with the ASC-ECU, the CAN bus lines may be defective. When malfunction occurs in the ASC-ECU power supply circuit and earth circuit, the CAN bus diagnosis detects the abnormality. This symptom also appears when an incorrect vehicle model is selected on the M.U.T.-III.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III selected vehicle model confirmation

Confirm which vehicle model is selected on the M.U.T.-III vehicle information screen.

Q: Is the correct vehicle model selected?

YES : Go to Step 2.
NO : Input the vehicle information correctly.

STEP 2. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

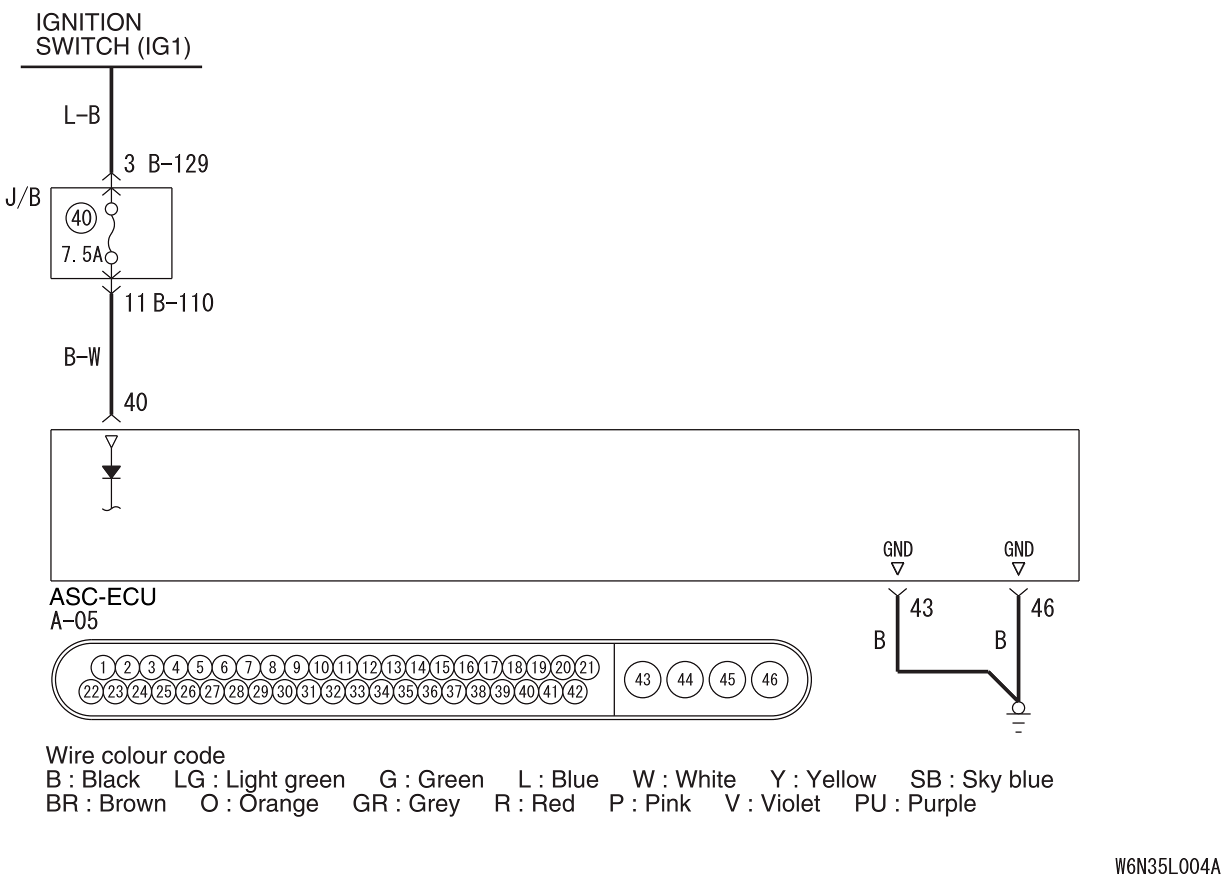
Q: Is the check result normal?

YES : Replace the ASC-ECU.
NO : Repair the CAN bus lines. (Refer to GROUP 54D – Troubleshooting P.54D-13.)

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Inspection Procedure 2: ASC-ECU power supply circuit malfunction

ASC-ECU Power Source Circuit



OPERATION

- The ASC-ECU is energised by the ignition switch (IG1) through multi-purpose fuse 40 and the ASC-ECU terminal No. 40.
- When malfunction occurs in ASC-ECU power supply, the communication with M.U.T.-III becomes unavailable.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Battery failure
- Charging system failed
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. Battery terminal voltage measurement

(1) Ignition switch: ON
(2) Engine: Started
(3) Measure the voltage between the battery terminals.

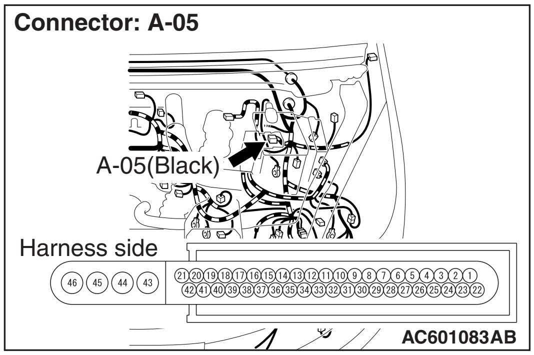
OK: 10V or more

Q: Is the check result normal?

YES : Go to Step 2.
NO : Diagnose the charging system. (Refer to GROUP 16 – On-vehicle Service P.16-6.)

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STEP 2. Connector check: A-05 ASC-ECU connector

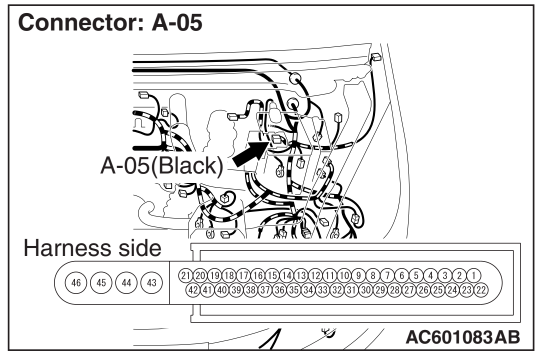


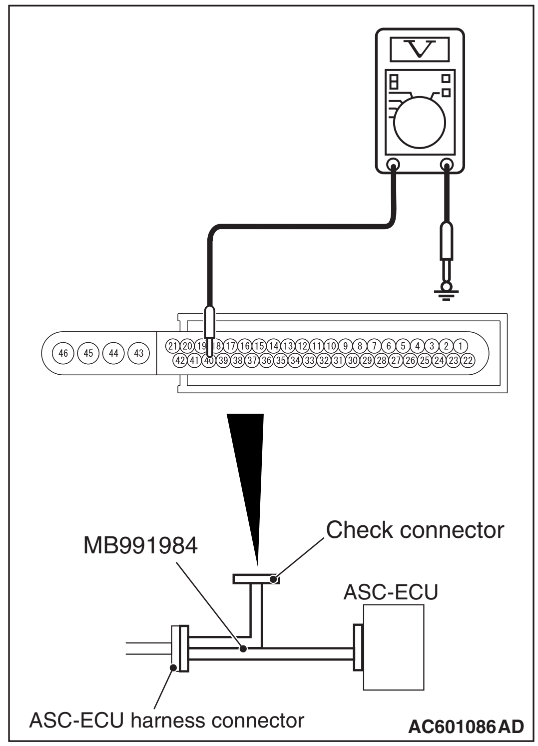
Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the damaged connector.

STEP 3. Voltage measurement: A-05 ASC-ECU connector





(1) Disconnect A-05 ASC-ECU connector, and connect the ABS check harness (Special tool: MB991984) to the ASC-ECU side connector and the harness side connector.
(2) Ignition switch: ON
(3) Engine: Started
(4) Measure the voltage between the ABS check harness (Special tool: MB991984) connector terminal No. 40 and the body earth.

OK: 10 V or more

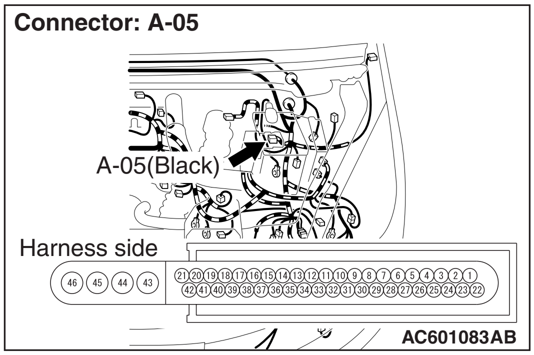
Q: Is the check result normal?

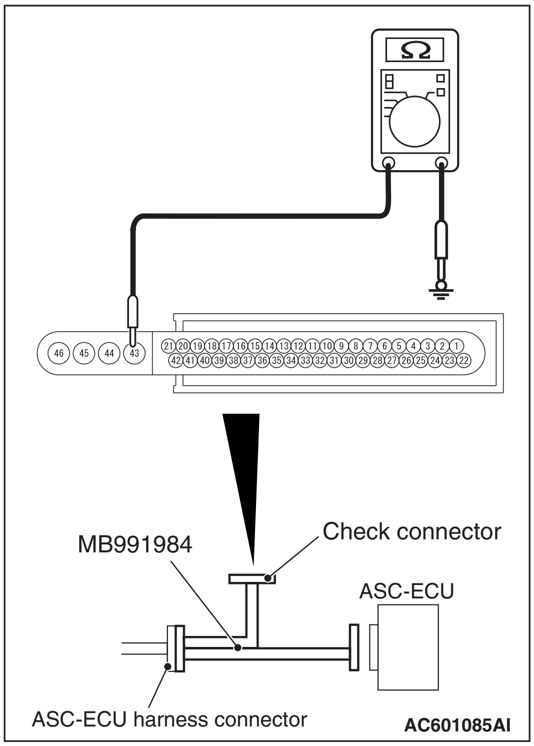
YES : Go to Step 4.

NO : Repair the harness wire between A-05 ASC-ECU connector terminal No. 40 and the ignition switch (IG1).

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STEP 4. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the A-05 ASC-ECU connector, and connect the ABS check harness (Special tool: MB991984) to the harness side connector.

NOTE: . Do not connect the ABS check harness (Special tool: MB991984) to the ASC-ECU.

(2) Measure the resistance between A-05 ASC-ECU connector terminal No. 43 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : . Go to Step 5.

NO : . Repair the harness wire between A-05 ASC-ECU connector terminal No. 43 and the body earth.

STEP 5. Retest the system.

Q: Can the ASC-ECU communicate with the M.U.T.-III?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : Replace the ASC-ECU.

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Inspection Procedure 3: The ABS warning lamp and the ASC indicator lamp don't illuminate when the ignition switch is turned ON.

COMMENTS ON TROUBLE SYMPTOM

- Drive signal of the ABS warning lamp and the ASC indicator lamp (including bulb check) is sent from the ASC-ECU to the combination meter through the CAN communication lines.
- If the combination meter detects a ASC time-out due to a failure in abnormal CAN communication, the combination meter illuminates the lamp.
- The ABS warning lamp and the ASC indicator lamp are non-replaceable LED. If the lamp is blown, replace the combination meter.
- Perform the actuator test to illuminate the lamps in the combination meter. If the lamp does not illuminate, replace the combination meter assembly. If the lamp illuminates, replace the ASC-ECU.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Combination meter assembly malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III actuator test for other systems

(1) Ignition switch: ON
(2) Execute combination meter actuator test.
- Item A0: Indicator lamp and warning lamp

OK: Illuminates

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the combination meter assembly.

STEP 2. M.U.T.-III diagnosis code for other systems

Check if the combination meter-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the combination meter. (Refer to GROUP 54A – Troubleshooting P.54A-31)
NO : Replace the ASC-ECU, and then go to Step 3.

STEP 3. Retest the system.

Q: Do the ABS warning lamp and the ASC indicator lamp illuminate when the ignition switch is turned ON?
YES : This diagnosis is complete.
NO : Replace the combination meter assembly.

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Inspection Procedure 4: ABS warning lamp and ASC indicator lamp do not extinguish after the engine is started.

COMMENTS ON TROUBLE SYMPTOM

- Drive signal of the ABS warning lamp and the ASC indicator lamp (including bulb check) is sent from the ASC-ECU to the combination meter through the CAN communication lines.
- If the combination meter detects a ASC time-out due to a failure in abnormal CAN communication, the combination meter illuminates the lamp.
- When malfunction occurs in the ASC-ECU power supply (i.e. excessively high resistance in the power supply or earth lines), this trouble symptom will appear, but the diagnosis code will not be set. If the vehicle is run at 15 km/h or more after that, the ASC-ECU set the diagnosis code No. C1861.
- Perform the actuator test to extinguish the lamp in the combination meter. If the lamp does not extinguish, replace the combination meter ASSY. If the lamp extinguishes, replace the ASC-ECU.
- The ABS warning lamp and the ASC indicator lamp are non-replaceable LED. If the lamp is blown, replace the combination meter.
- When malfunction occurs in the steering wheel sensor or the ASC-ECU power supply system and earth system, the ABS warning lamp may illuminate when the ignition system is turned ON even after returning to the normal condition. In this case, the ABS warning lamp goes out when the ASC-ECU finishes self-check operation of the following items.
  - Steering wheel sensor: Self-check operation is finished at approximately 10km/h.
  - ASC-ECU: Self-check operation is finished at approximately 15 km/h.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Combination meter assembly malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54D − Troubleshooting P.54D-13.) On completion, go to Step 2.

STEP 2. M.U.T.-III diagnosis code

Q: Is the diagnosis code No. C1861 set?

YES : Carry out the diagnosis for the diagnosis code.(Refer to P.35C-72.)
NO : Go to Step 3.

STEP 3. M.U.T.-III actuator test for other systems

(1) Ignition switch: ON
(2) Execute combination meter actuator test.
- Item A1: Indicator lamp and warning lamp

OK: OFF

Q: Is the check result normal?

YES : Replace the ASC-ECU, and then go to Step 4.
NO : Replace the combination meter assembly.

STEP 4. Retest the system.

Q: Do the ABS warning lamp and the ASC indicator lamp illuminate when the ignition switch is turned ON?

YES : This diagnosis is complete.
NO : Replace the combination meter assembly.

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Inspection Procedure 5: Brake warning lamp does not illuminate at all.

COMMENTS ON TROUBLE SYMPTOM

- When EBD is abnormal and the brake fluid level is low, the ASC-ECU sends the brake warning lamp drive signal to the combination meter through the CAN communication lines.
- The ASC-ECU sends the lamp drive signal to the combination meter during a bulb check (for three seconds after the ignition switch is turned on) through the CAN communication lines, and then the combination meter activates the lamp.
- If the combination meter detects a ASC time-out due to a failure in abnormal CAN communication, the combination meter illuminates the lamp.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Combination meter assembly malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III actuator test for other systems

(1) Ignition switch: ON
(2) Execute combination meter actuator test.
- Item A0: Indicator lamp and warning lamp

OK: Illuminates

Q: Is the check result normal?

YES : . Go to Step 2.
NO : . Replace the combination meter assembly.

STEP 2. M.U.T.-III diagnosis code for other systems

Check if the combination meter-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Troubleshoot the combination meter. (Refer to GROUP 54A – Troubleshooting P.54A-31)
NO : Replace the ASC-ECU, and then go to Step 3.

STEP 3. Retest the system.

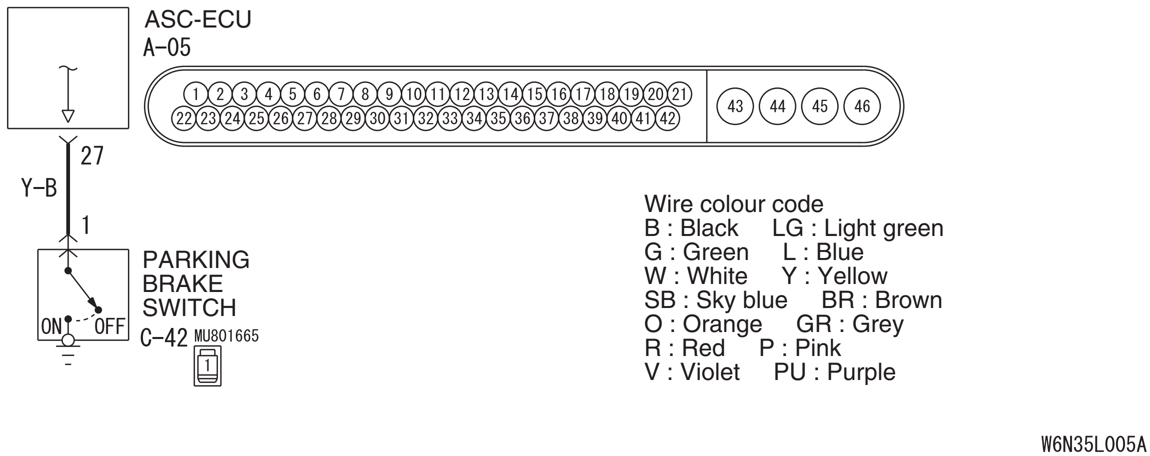
Q: Do the ABS warning lamp and the ASC indicator lamp illuminate when the ignition switch is turned ON?

YES : This diagnosis is complete.
NO : Replace the combination meter assembly.

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Inspection Procedure 6: Brake warning lamp does not illuminate when the parking brake is operated. (Illuminates when the bulb check is operated.)

Parking Brake Switch Circuit



COMMENTS ON TROUBLE SYMPTOM

- When the parking brake is operated, the ASC-ECU sends the brake warning lamp drive signal to the combination meter through the CAN communication lines.
- The ASC-ECU sends the lamp drive signal to the combination meter during a bulb check (for three seconds after the ignition switch is turned on) through the CAN communication lines, and then the combination meter activates the lamp.
- If the combination meter detects a ASC time-out due to a failure in abnormal CAN communication, the combination meter illuminates the lamp.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Parking brake switch malfunction
- Combination meter assembly malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III data list

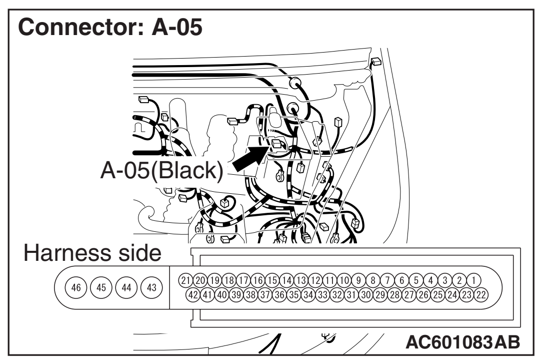
Using the data list, check that the parking brake input signal is normal. (Refer to P.35C-109.)

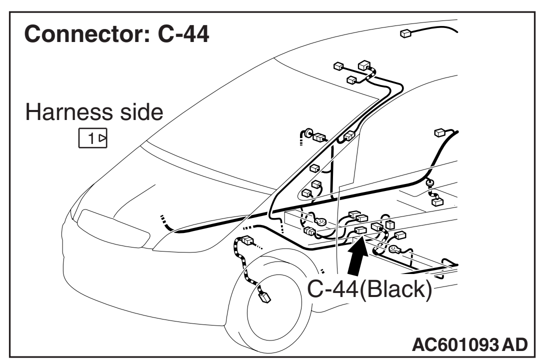
- Item No.28: side brake switch

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check A-05 ASC-ECU connector and C-44 parking brake switch connector.





Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair.

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STEP 3. Check the parking brake switch as single unit.

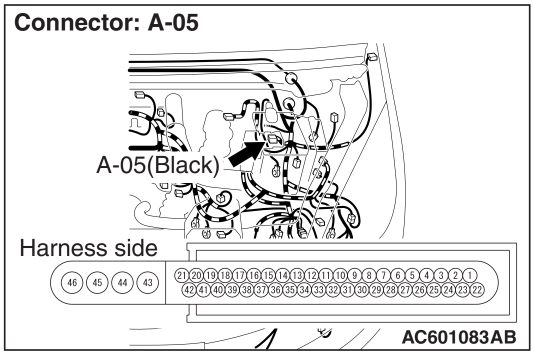
Refer to GROUP 36 – On-vehicle Service P.36-5.

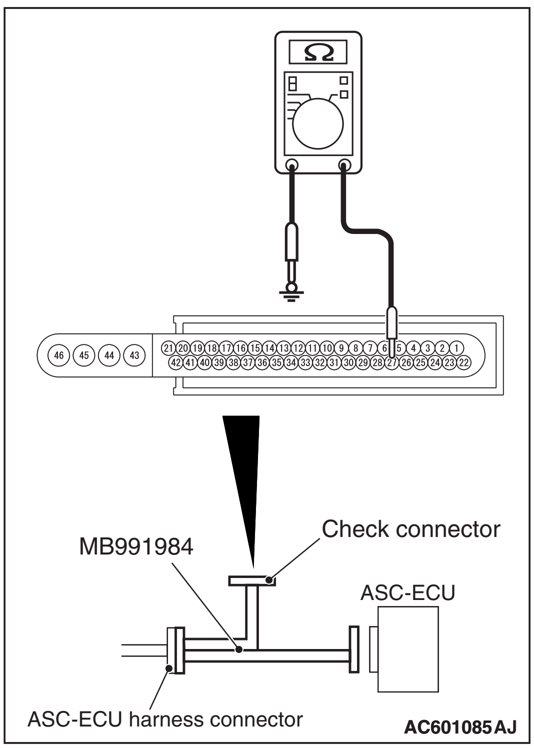
Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the parking brake switch. (Refer to GROUP 36 – Parking brake lever P.36-7.)

STEP 4. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the A-05 ASC-ECU connector, and connect the ABS check harness (Special tool: MB991984) to the harness side connector.

NOTE: . Do not connect the ABS check harness (Special tool: MB991984) to the ASC-ECU.

(2) Pull the parking brake lever and turn the parking brake switch to ON.

(3) Measure the resistance between A-05 ASC-ECU connector terminal No. 27 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the harness wire between A-05 ASC-ECU connector terminal No. 27 and C-44 parking brake switch connector terminal No. 1.

STEP 5. Retest the system.

Q: Does the brake warning lamp illuminate when the parking brake is operated?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : Replace the ASC-ECU.

STEP 6. Retest the system.

Q: Does the brake warning lamp illuminate when the parking brake is operated?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : Replace the combination meter assembly, and then go to Step 7.

STEP 7. Retest the system.

Q: Does the brake warning lamp illuminate when the parking brake is operated?

YES : This diagnosis is complete.

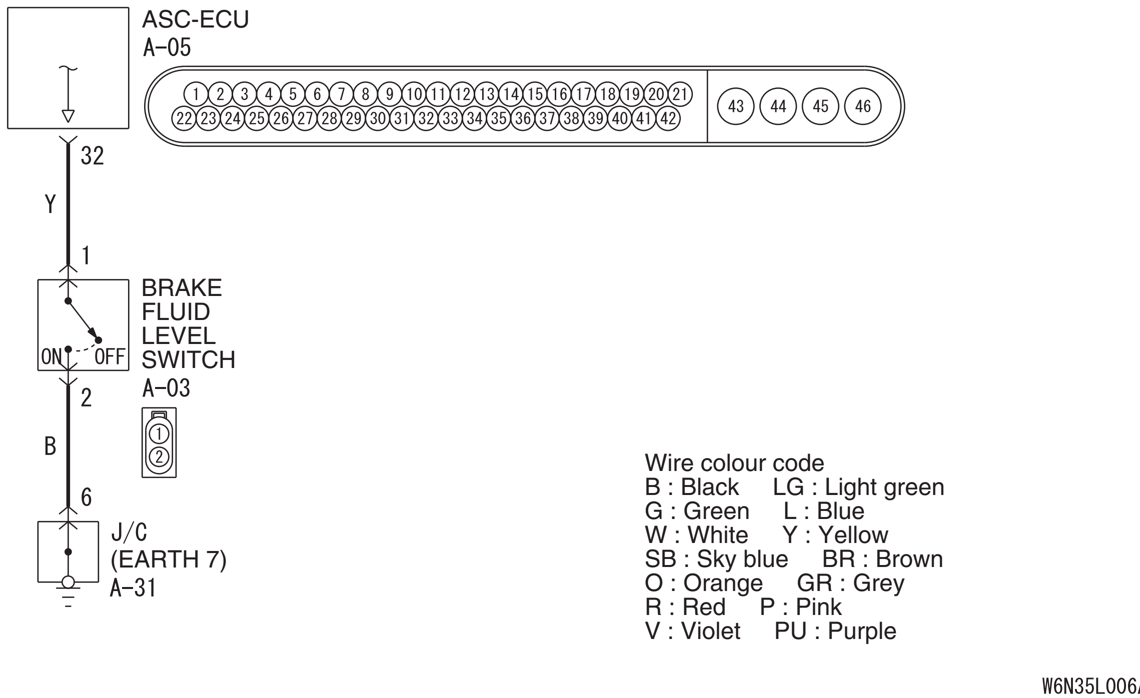
NO : Replace the ASC-ECU.

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Inspection Procedure 7: Brake warning lamp does not illuminate when the brake fluid level is low. illuminates when the parking brake is operated.)

Brake Fluid Level Switch Circuit



COMMENTS ON TROUBLE SYMPTOM

- When the brake fluid level is low, the ASC-ECU sends the brake warning lamp drive signal to the combination meter through the CAN communication lines.
- The ASC-ECU sends the lamp drive signal to the combination meter during a bulb check (for three seconds after the ignition switch is turned on) through the CAN communication lines, and then the combination meter activates the lamp.
- If the combination meter detects a ASC time-out due to a failure in abnormal CAN communication, the combination meter illuminates the lamp.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Brake fluid level switch malfunction
- Combination meter assembly malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III data list

Using the data list, check that the brake fluid level switch signal is normal.(Refer to P.35C-109.)

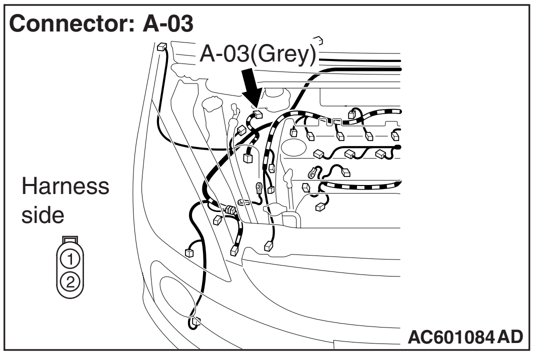
- Item No. 32: Brake fluid level switch

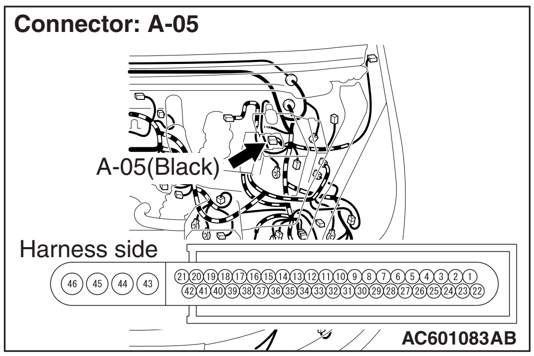
Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 2.

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STEP 2. Check A-03 brake fluid level switch connector and A-05 ASC-ECU connector.





Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair.

STEP 3. Check the brake fluid level switch as a single unit.

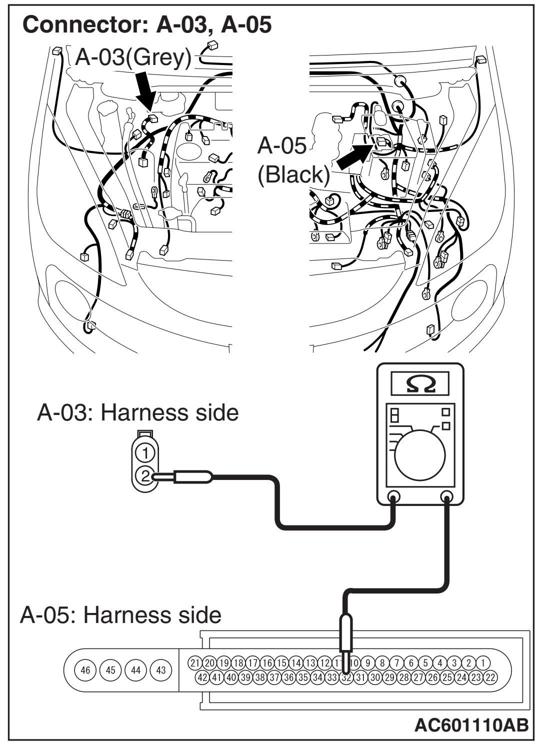
Refer to GROUP 35A − On-vehicle Service P.35A-11.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the reservoir assembly. (Refer to GROUP 35A − Master cylinder assembly and brake booster P.35A-23.)

STEP 4. Measure the resistance at A-03 brake fluid level switch connector and A-05 ASC-ECU connector.



(1) Disconnect A-03 brake fluid level switch connector and A-05 ASC-ECU connector.
(2) Make the brake fluid below the specified level, and turn ON the brake fluid level switch.
(3) Measure the resistance between A-03 brake fluid level switch connector terminal No. 2 and A-05 ASC-ECU connector terminal No. 32.

OK: Continuity exists (2 Ω or less)

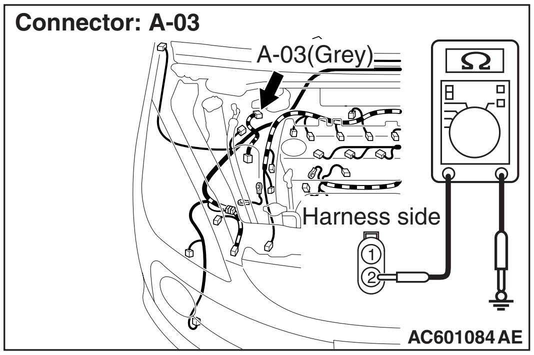
Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the harness wire between A-03 brake fluid level switch connector terminal No. 2 and A-05 ASC-ECU connector terminal No. 32.

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STEP 5. Measure the resistance at A-03 brake fluid level switch connector.



(1) Disconnect A-03 brake fluid level switch connector.
(2) Measure the resistance between A-03 brake fluid level switch connector terminal No. 2 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair the harness wire between A-03 brake fluid level switch connector terminal No. 2 and body earth.

STEP 6. Retest the system.

Q: Does the brake warning lamp illuminate when the brake fluid level is low?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)
NO : Replace the combination meter assembly, and then go to Step 7.

STEP 7. Retest the system.

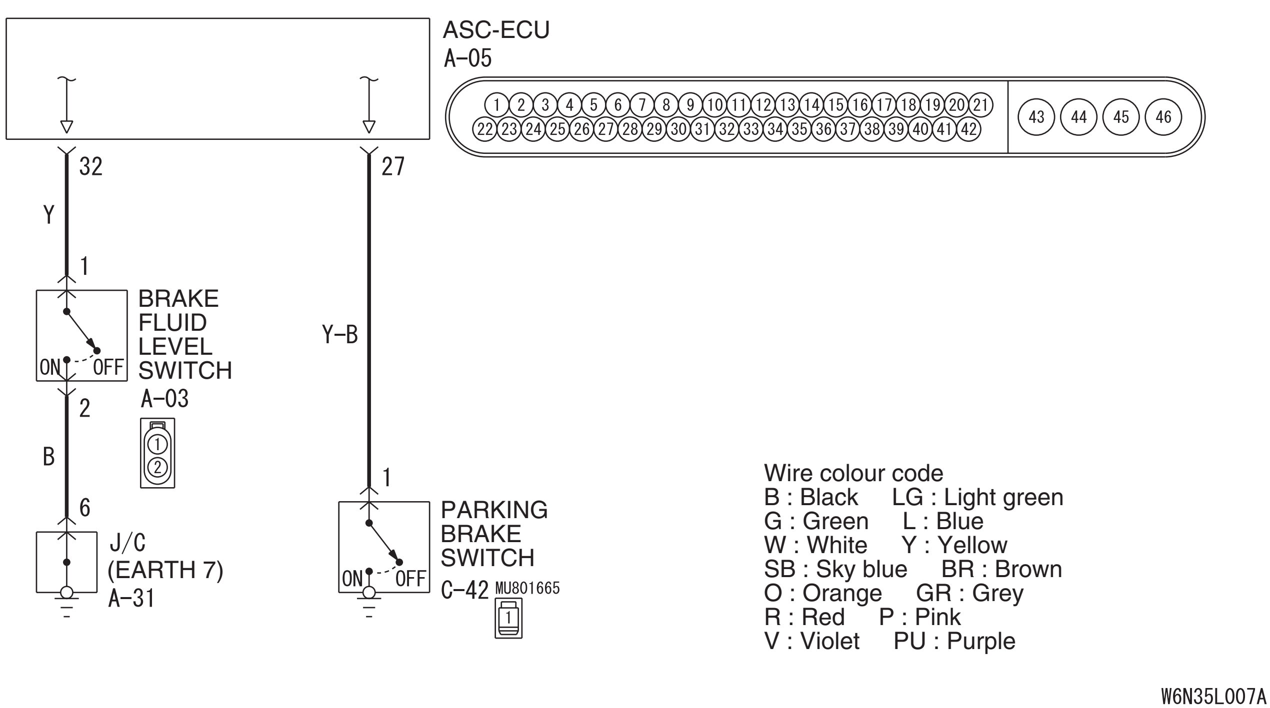
Q: Does the brake warning lamp illuminate when the brake fluid level is low?
YES : This diagnosis is complete.
NO : Replace the ASC-ECU.

STEP 8. Retest the system.

Q: Does the brake warning lamp illuminate when the brake fluid level is low?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)
NO : Replace the ASC-ECU.

Inspection Procedure 8: Brake warning lamp does not extinguish when the ignition switch is ON. (Always illuminates)

Brake Fluid Level Switch and Parking Brake Switch Circuit



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COMMENTS ON TROUBLE SYMPTOM

- The brake warning lamp drive signal at the EBD system error and the low brake fluid level is sent from the ASC-ECU to the combination meter through the CAN communication lines.
- If the combination meter detects a ASC time-out due to a failure in the power supply to the ASC-ECU or abnormal CAN communication, the combination meter illuminates the lamp.
- The ASC-ECU sends the lamp drive signal to the combination meter during a bulb check (for three seconds after the ignition switch is turned on) through the CAN communication lines, and then the combination meter activates the lamp.
- If the combination meter detects a ASC time-out due to a failure in abnormal CAN communication, the combination meter illuminates the lamp.
- This symptom appears when the brake fluid level switch or the parking brake switch is shorted to earth. When the brake fluid level witch is shorted to earth, the diagnosis code No. C1345 is set.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Parking brake switch malfunction
- Brake fluid level switch malfunction
- Combination meter assembly malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. Check the brake fluid level.

Check that the brake fluid is filled to the specified.

Q: Is the check result normal?

YES : Check the brake pad remaining thickness, fill the brake fluid to the specified, and then go to Step 12.

NO : Go to Step 2.

STEP 2. M.U.T.-III data list

Using the data list, check that the parking brake input signal and the brake fluid level switch signal are normal.(Refer to P.35C-109.)

- Item No. 28: Side brake switch
- Item No. 32: Brake fluid level switch

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 3.

STEP 3. Check the brake fluid level switch as a single unit.

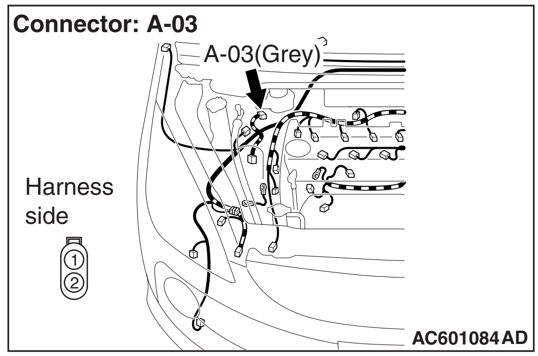
Refer to GROUP 35A – On-vehicle Service P.35A-11.

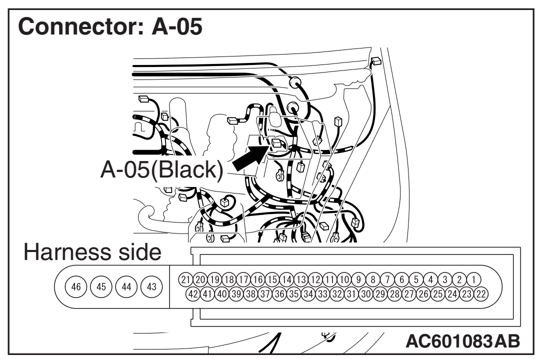
Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the reservoir assembly. (Refer to GROUP 35A – Master cylinder assembly and brake booster P.35A-23.)

STEP 4. Check A-03 brake fluid level switch connector and A-05 ASC-ECU connector.





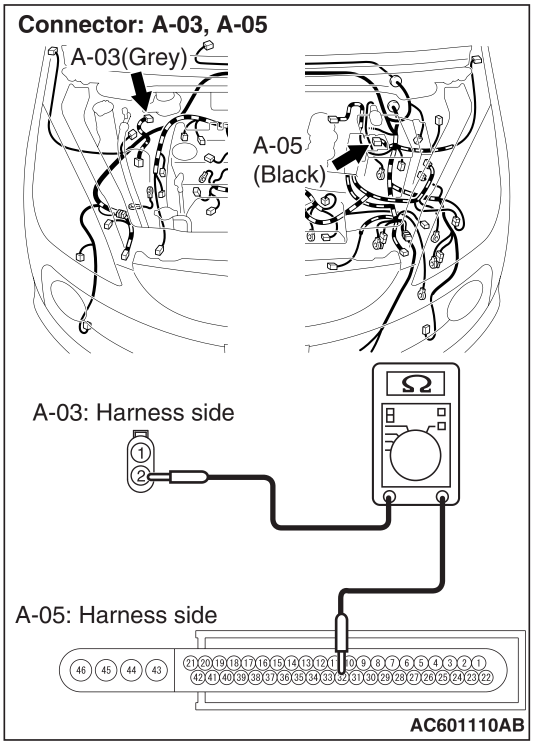
Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the A-03 brake fluid level switch connector and the A-05 ASC-ECU connector.

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STEP 5. Measure the resistance at A-03 brake fluid level switch connector and A-05 ASC-ECU connector.



(1) Disconnect A-03 brake fluid level switch connector and A-05 ASC-ECU connector.
(2) Make the brake fluid below the specified level, and turn ON the brake fluid level switch.
(3) Measure the resistance between A-03 brake fluid level switch connector terminal No. 2 and A-05 ASC-ECU connector terminal No. 32.

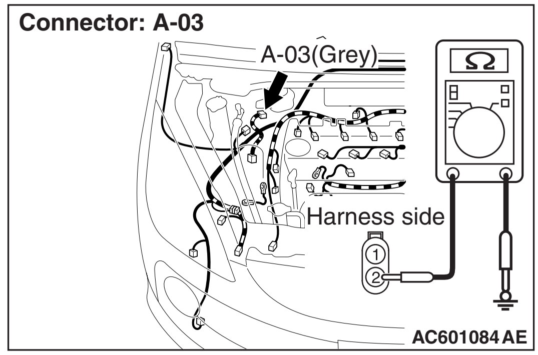
OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the harness wire between A-03 brake fluid level switch connector terminal No. 2 and A-05 ASC-ECU connector terminal No. 32.

STEP 6. Measure the resistance at A-03 brake fluid level switch connector.



(1) Disconnect A-03 brake fluid level switch connector.
(2) Measure the resistance between A-03 brake fluid level switch connector terminal No. 2 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the harness wire between A-03 brake fluid level switch connector terminal No. 2 and body earth.

STEP 7. Check the parking brake switch as single unit.

Refer to GROUP 36 – On-vehicle Service P.36-5.

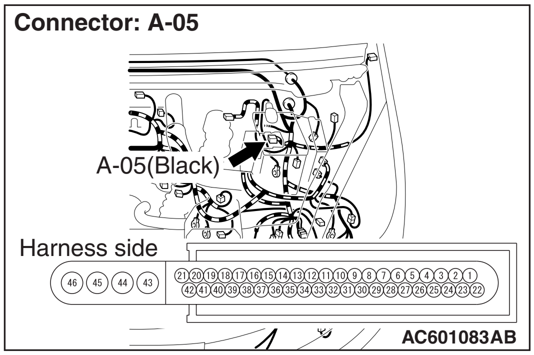
Q: Is the check result normal?

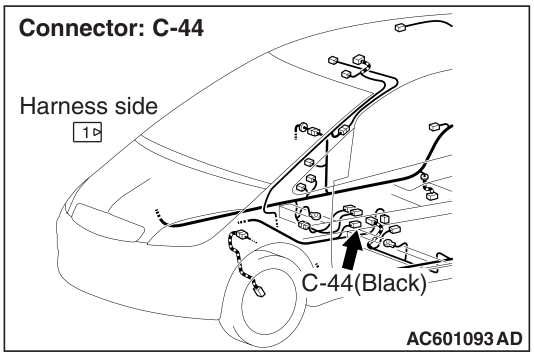
YES : Go to Step 8.

NO : Replace the parking brake switch. (Refer to GROUP 36 – Parking brake lever P.36-7.)

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STEP 8. Check A-05 ASC-ECU connector and C-42 parking brake switch connector.



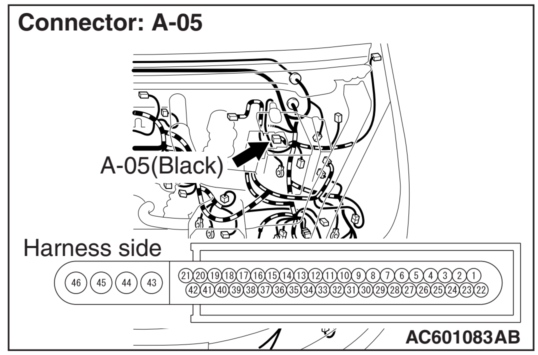


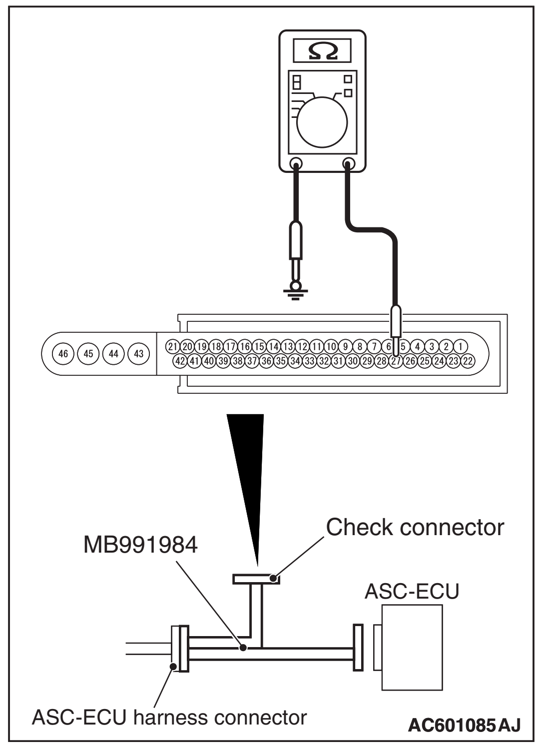
Q: Is the check result normal?

YES : Go to Step 9.

NO : Repair.

STEP 9. Measure the resistance at A-05 ASC-ECU connector.





(1) Disconnect the A-05 ASC-ECU connector.
(2) Pull the parking brake lever and turn the parking brake switch to ON.
(3) Measure the resistance between A-05 ASC-ECU connector terminal No. 27 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 12.

NO : Repair the harness wire between A-05 ASC-ECU connector terminal No. 27 and C-42 parking brake switch connector terminal No. 1.

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STEP 10. Retest the system.

Q: Does the brake warning lamp go off when the ignition switch is ON?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : Replace the combination meter assembly, and then go to Step 11.

STEP 11. Retest the system.

Q: Does the brake warning lamp go off when the ignition switch is ON?

YES : This diagnosis is complete.

NO : Replace the ASC-ECU.

STEP 12. Retest the system.

Q: Does the brake warning lamp go off when the ignition switch is ON?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : Replace the ASC-ECU.

Inspection Procedure 9: The stability control system operates too frequently. (the diagnosis code is not set.)

COMMENTS ON TROUBLE SYMPTOM

- This symptom does not appear due to a failure in wiring harness (open or short circuit, or excessive resistance). Therefore, if the sensors are installed properly and the check result does not indicate any problems, replace the ASC-ECU.
- This symptom does not appear at steering wheel sensor calibration. (The diagnosis code is set.)

NOTE: If the steering neutral position fluctuates slightly, the ASC system may activate early.

PROBABLE CAUSES

- Wheel speed sensor malfunction
- G and yaw rate sensor malfunction
- Steering wheel sensor malfunction
- Wheel bearing malfunction
- ASC-ECU malfunction
- Malfunction of magnetic encoder for wheel speed detection

DIAGNOSTIC PROCEDURE

STEP 1. G and yaw rate sensor installation check

Check that the G and yaw rate sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Reinstall the G and yaw rate sensor correctly.

STEP 2. M.U.T.-III data list

Using the data list, check the G and yaw rate sensor output value.(Refer to P.35C-109.)

- Item No. 14: Lateral G-sensor
- Item No.17: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 3.

NO : Replace the G and yaw rate sensor.

STEP 3. Steering wheel sensor installation state check

Check that the steering wheel sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Install the steering wheel sensor correctly.

STEP 4. M.U.T.-III data list

Using the data list, check the steering sensor output value.(Refer to P.35C-109.)

- Item No. 16: Steering angle sensor

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the steering wheel sensor.

STEP 5. Check how wheel speed sensor is installed.

Check that the wheel speed sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Reinstall the wheel speed sensor correctly.

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STEP 6. Check for wheel speed sensor as a single unit

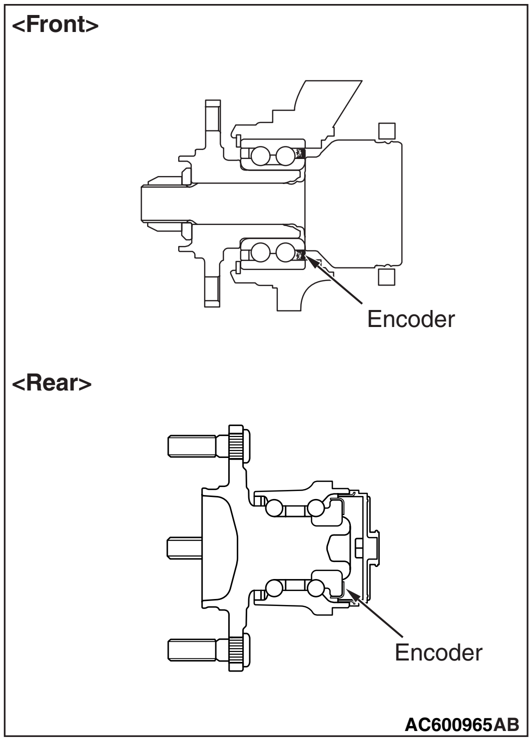
Refer to GROUP 35B – Wheel speed sensor P.35B-81.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the wheel speed sensor.

STEP 7. Wheel speed detection magnetic encoder check



Check the wheel speed detection magnetic encoder for adhesion of foreign materials or deformation.

NOTE: For the rear wheel speed detection magnetic encoder, check from the mounting hole of the wheel speed sensor by rotating the rear hub.

Q: Is the check result normal?

YES : . Go to Step 8.

NO <Front> : . If foreign objects are found, clean the magnetic encoder for wheel speed detection. When the encoder is deformed, replace the wheel bearing. (Refer to GROUP 26 – Front Axle Hub Assembly P.26-13.)

NO <Rear> : . If foreign objects are found, clean the magnetic encoder for wheel speed detection. When the encoder is deformed, replace the rear hub assembly. (Refer to GROUP 27 – Rear Axle Hub Assembly P.27-6.)

STEP 8. Check the wheel bearing.

NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check each wheel bearing for looseness.

Front: Refer to GROUP 26 – On-vehicle Service P.26-5.

Rear: Refer to GROUP 27 – On-vehicle Service P.27-3.

Q: Is the check result normal?

YES : Go to Step 9.

NO <Front> : Replace the wheel bearing. (Refer to GROUP 26 – Front Axle Hub Assembly P.26-13.)

NO <Rear> : Replace the rear hub assembly. (Refer to GROUP 27 – Rear Axle Hub Assembly P.27-6.)

STEP 9. Retest the system.

Q: Does the stability control system operate too frequently?

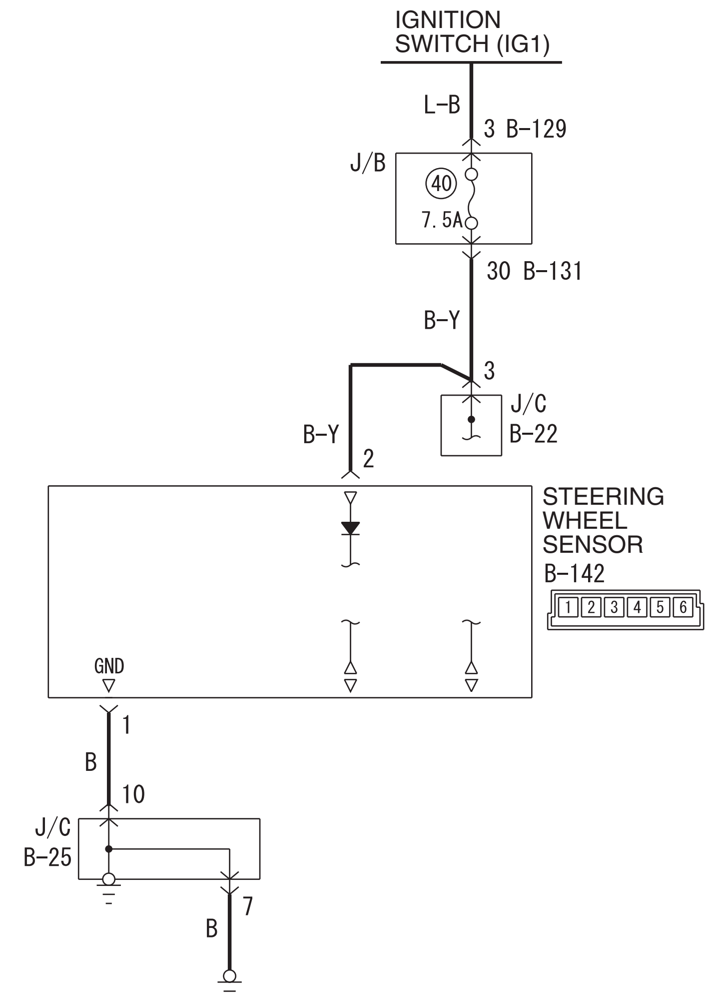
YES : Replace the ASC-ECU.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

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Inspection Procedure 10: Steering wheel sensor power supply system

Steering Wheel Sensor Power Source Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple

W6N35L008A

OPERATION

The steering wheel sensor is energised by the ignition switch (IG1) through the multi-purpose fuse No. 40 and the steering wheel sensor terminal No. 2.

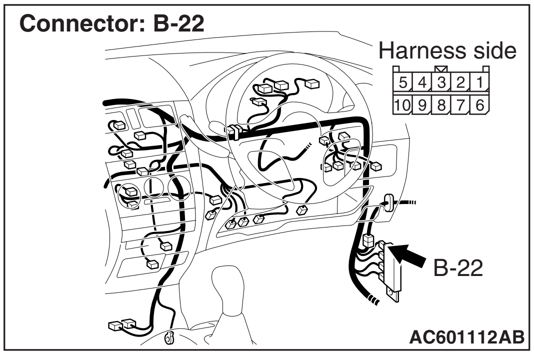
PROBABLE CAUSES

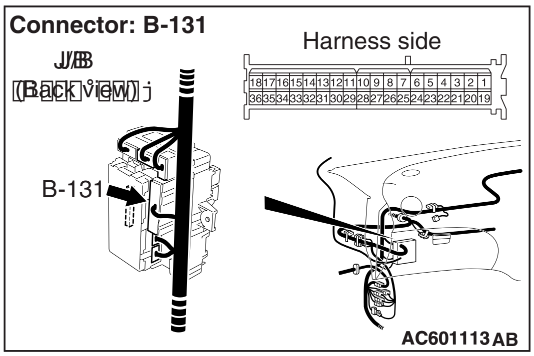
- Damaged wiring harness and connectors
- Steering wheel sensor malfunction

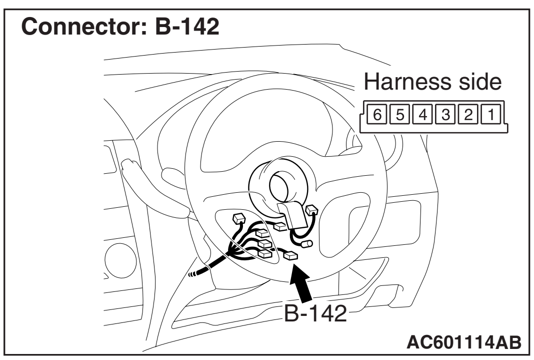
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DIAGNOSTIC PROCEDURE

STEP 1. Connector inspection: B-22 joint connector, B-131 junction block connector, B-142 steering wheel sensor connector





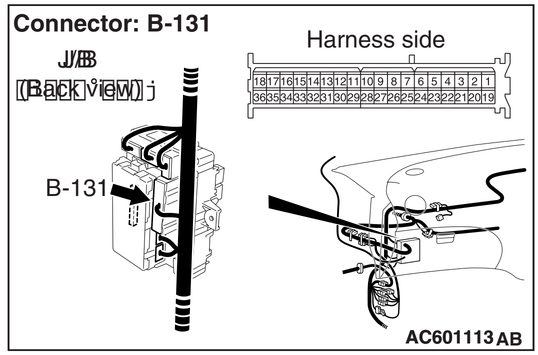


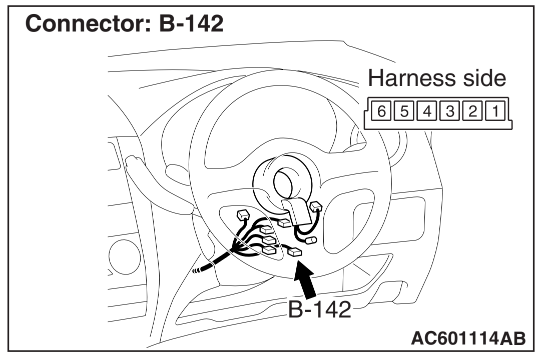
Q: Is the check result normal?

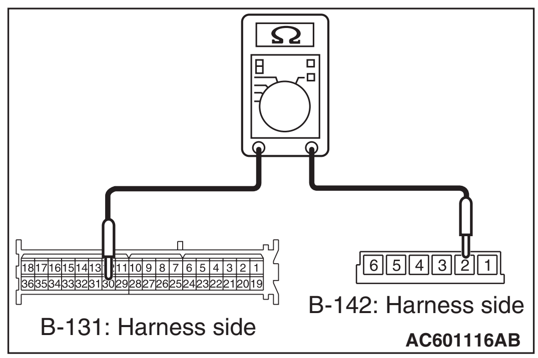
YES : Go to Step 2.

NO : Repair the damaged connector.

STEP 2. Measure the resistance between B-142 steering wheel sensor connector and B-131 junction block connector.







(1) Disconnect B-142 steering wheel sensor connector and B-131 junction block connector.

(2) Measure the resistance between B-142 steering wheel sensor connector terminal No. 2 and B-131 junction block connector terminal No. 30.

OK: Continuity exists (2 Ω or less)

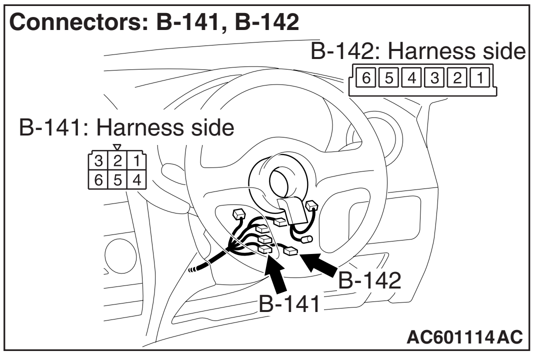
Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 3.

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STEP 3. Check the wiring harness between B-142 steering wheel sensor connector terminal No. 2 and the ignition switch (IG1).



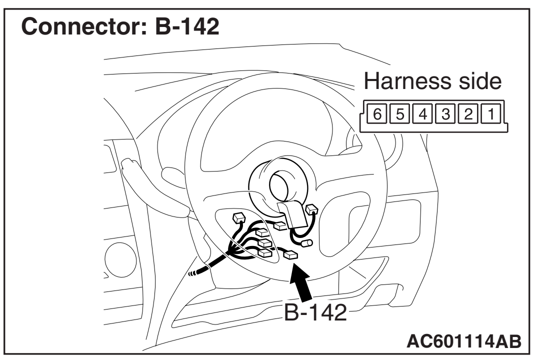
Check the power supply line for open circuit.

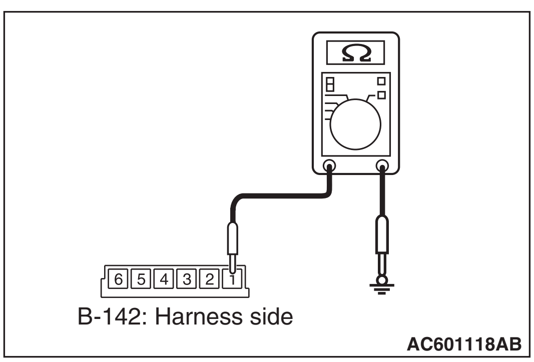
Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : Repair the wiring harness between B-142 steering wheel sensor connector terminal No. 2 and the ignition switch (IG1).

STEP 4. Measure the resistance at B-142 steering wheel sensor connector.





(1) Disconnect B-142 steering wheel sensor connector, and measure at the wiring harness-side connector.

(2) Measure the resistance between B-142 steering wheel sensor connector terminal No. 1 and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the wiring harness between B-142 steering wheel sensor connector terminal No. 1 and the body earth.

STEP 5. Retest the system.

Check that the steering wheel sensor communicates with the ASC-ECU normally.

NOTE: When the steering wheel sensor related diagnosis code is not set to ACS-ECU and the steering wheel sensor is normal at the M.U.T.-III CAN bus diagnosis, the communication with the steering wheel sensor is normal.

Q: Is the check result normal?

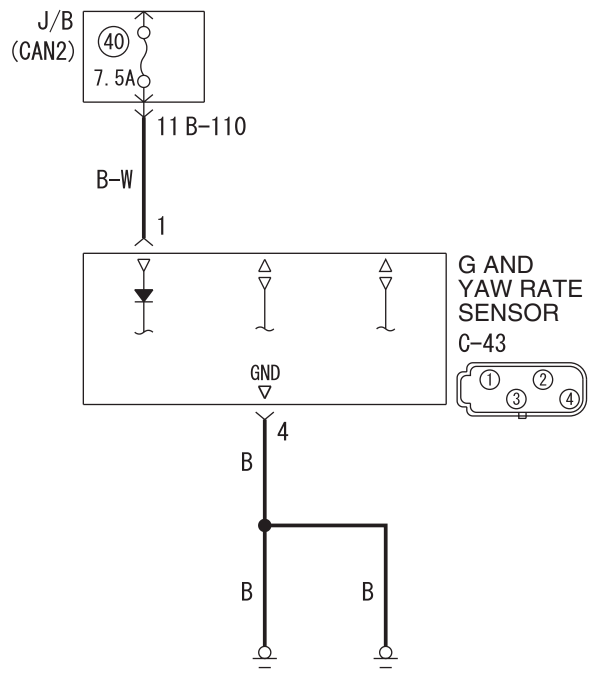
YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : Replace the steering wheel sensor.

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Inspection Procedure 11: G and yaw rate sensor power supply circuit

G and Yaw Rate Sensor Power Source Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple

W6N35L003A

OPERATION

The G and yaw rate sensor is energised by the ignition switch (IG1) through the multi-purpose fuse No. 40 and the G and yaw rate sensor terminal No. 1.

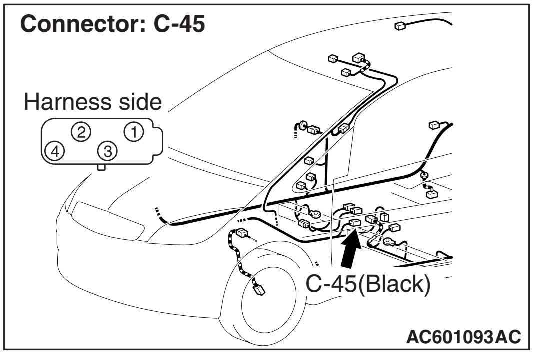
PROBABLE CAUSES

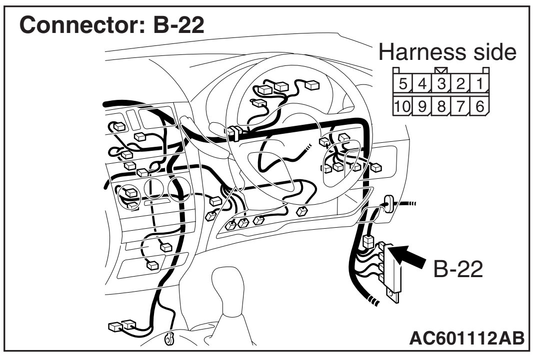
- Damaged wiring harness and connectors
- G and yaw rate sensor malfunction

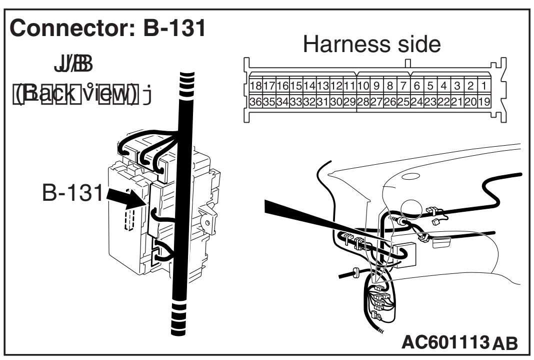
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DIAGNOSTIC PROCEDURE

STEP 1. Connector check: C-45 G and yaw rate sensor connector, B-22 Joint connector and B-131 junction block connector





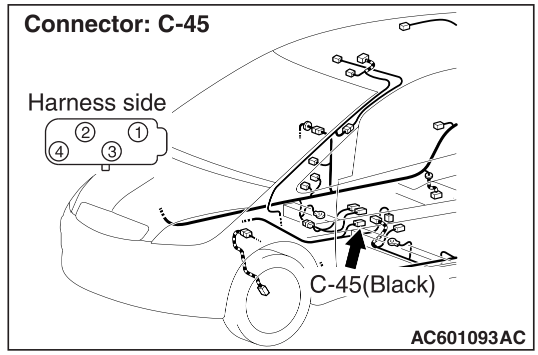


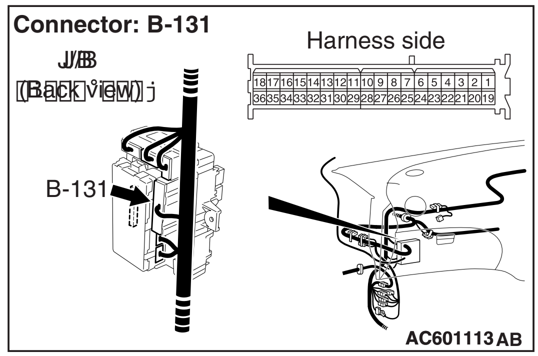
Q: Is the check result normal?

YES : Go to Step 2.

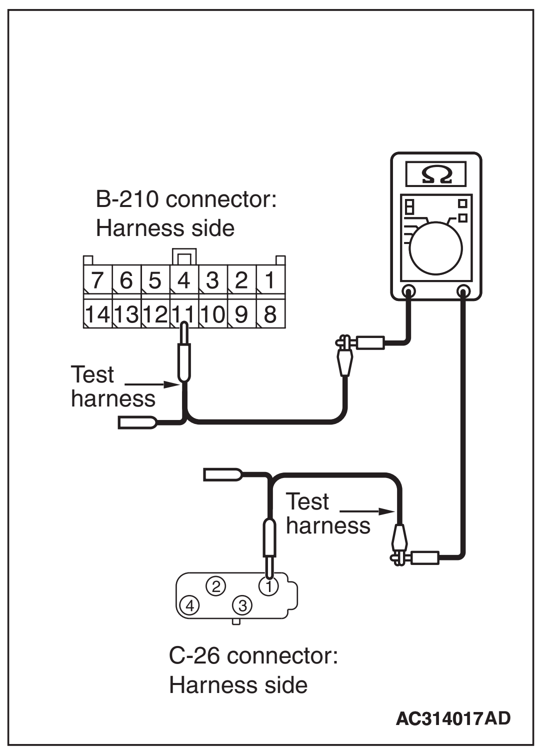
NO : Repair the damaged connector.

STEP 2. Measure the resistance between C-45 G and yaw rate sensor connector and B-131 junction block connector.





(1) Disconnect C-45 G and yaw rate sensor connector and connect B-131 junction block connector.



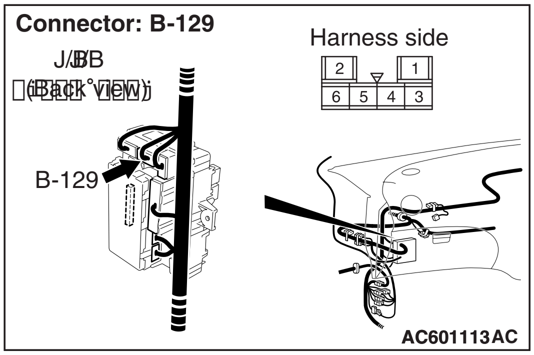
(2) Resistance between C-45 G and yaw rate sensor connector terminal No. 1 and B-131 junction block connector terminal No. 30

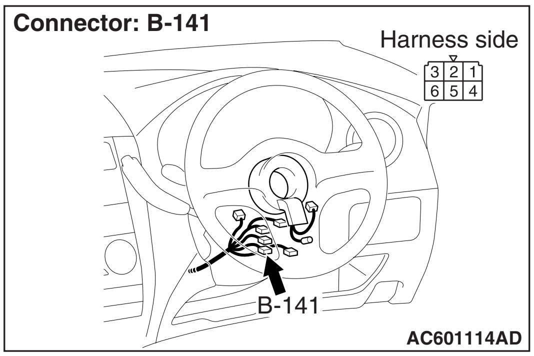
OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check the wiring harness between B-129 junction block connector terminal No. 3 and the ignition switch (IG1).



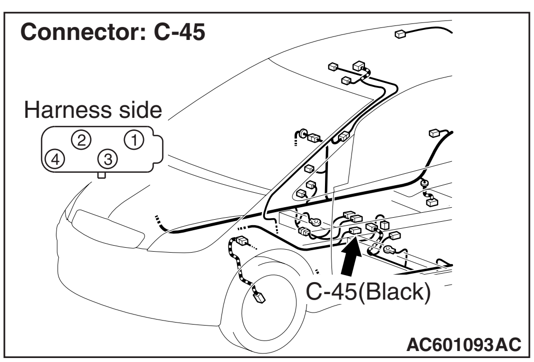


- Check the power supply line for open circuit.

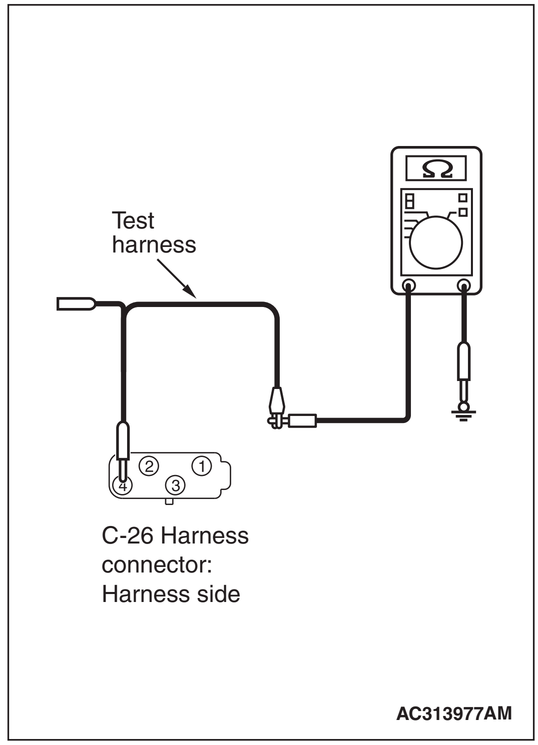
Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)
NO : Repair the wiring harness.

STEP 4. Measure the resistance at C-45 G and yaw rate sensor connector.



(1) Disconnect C-45 G and yaw rate sensor connector, and measure at the harness side.



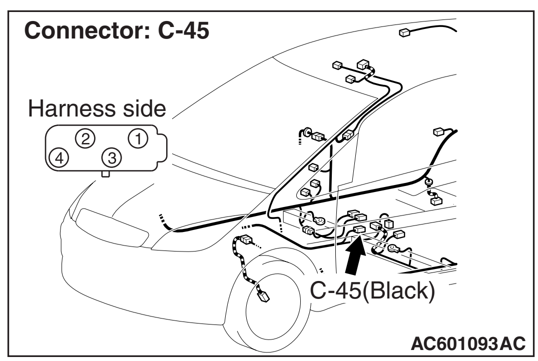
(2) Resistance between C-45 G and yaw rate sensor connector terminal No. 4 and the body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check the harness wire between C-45 G and yaw rate sensor connector terminal No. 4 and the body earth.



- Check the earth wires for open circuit.

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)
NO : Repair the wiring harness.

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STEP 6. System retest

Check that the G and yaw rate sensor communicates with the ASC-ECU normally.

NOTE: When the G and yaw rate sensor related diagnosis code is not set to ASC-ECU and the G and yaw rate sensor is not indicated in red at the M.U.T.-III CAN bus diagnosis, the communication with the G and yaw rate sensor is normal.

Q: Is the check result normal?

YES : . Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-13.)

NO : . Replace the G and yaw rate sensor.

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DATA LIST REFERENCE TABLE

M1357001200017

Among the ASC-ECU input data, the following items can be read by using the M.U.T.-III.

Item No.	Check items	Check conditions	Normal conditions
01	FR wheel speed sensor	Drive the vehicle.	The speedometer display and the M.U.T.-III display almost agree with each other.
02	FL wheel speed sensor		
03	RR wheel speed sensor		
04	RL wheel speed sensor		
05	Power supply voltage	Always	8 V or more
07	Valve relay	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
10	Stop lamp switch (input value)	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
11	Stop lamp switch	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
12	Brake switch (input value)	The brake pedal is depressed.	OFF
		The brake pedal is released.	ON
13	Brake switch	The brake pedal is depressed.	OFF
		The brake pedal is released.	ON
14	Lateral G-sensor (+: right turn, -: left turn)	Vehicle stopped (level)	–1.1 to 1.1 m/s^2
		Running	–17.7 to 17.7 m/s^2
15	Master cylinder pressure sensor	The brake pedal is depressed.	Increases by the amount of the brake pedal depression.
		The brake pedal is released.	0 –15 bar
16	Steering angle sensor (-: right turn, +: left turn)	Position the steering wheel in a straight ahead direction.	-5 – 5 °
		Running (when ASC-ECS is judged as normal.)	-500 – 500 °
		Single unit check (when the sensor unit is normal.)	-720 – 720 °
17	Yaw rate sensor (-: right turn, +: left turn)	Vehicle stopped	-4 – 4 °/s
		Running	-100.2 – 99.8 °/s
20	FL inlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF

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Item No.	Check items	Check conditions	Normal conditions
21	FL outlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
22	FR inlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
23	FR outlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
24	RL inlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
25	RL outlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
26	RR inlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
27	RR outlet valve	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF
28	Side brake switch	The parking brake lever is pulled.	ON
		The parking brake lever is released.	OFF
29	Pump motor	The ABS, EBD, stability control system, and TCL are operated.	ON
		The ABS, EBD, stability control system, and TCL are not operated.	OFF

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Item No.	Check items	Check conditions	Normal conditions
30	SAS calibration flag	The steering wheel sensor calibration is completed.	Completion
		The steering wheel sensor calibration is not completed.	Incompletion
31	SAS fail flag	The steering wheel sensor output is normal.	Normal
		The steering wheel sensor output is abnormal.	Fail
32	Brake fluid level switch	The brake fluid level in the brake fluid reservoir is above "MIN."	OFF
		The brake fluid level in the brake fluid reservoir is below "MIN."	ON
33	ASC OFF switch	The ASC OFF switch is pressed.	ON
		The ASC OFF switch is not operated.	OFF
34	FL/RR diagonal suction valve	The stability control system and TCL are operated.	ON
		The stability control system and TCL are not operated.	OFF
35	FR/RL diagonal suction valve	The stability control system and TCL are operated.	ON
		The stability control system and TCL are not operated.	OFF
36	FL/RR diagonal cut valve	The stability control system and TCL are operated.	ON
		The stability control system and TCL are not operated.	OFF
37	FR/RL diagonal cut valve	The stability control system and TCL are operated.	ON
		The stability control system and TCL are not operated.	OFF

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ACTUATOR TEST TABLE

M1357001300014

Using the M.U.T.-III, the following actuators can be forcibly operated:

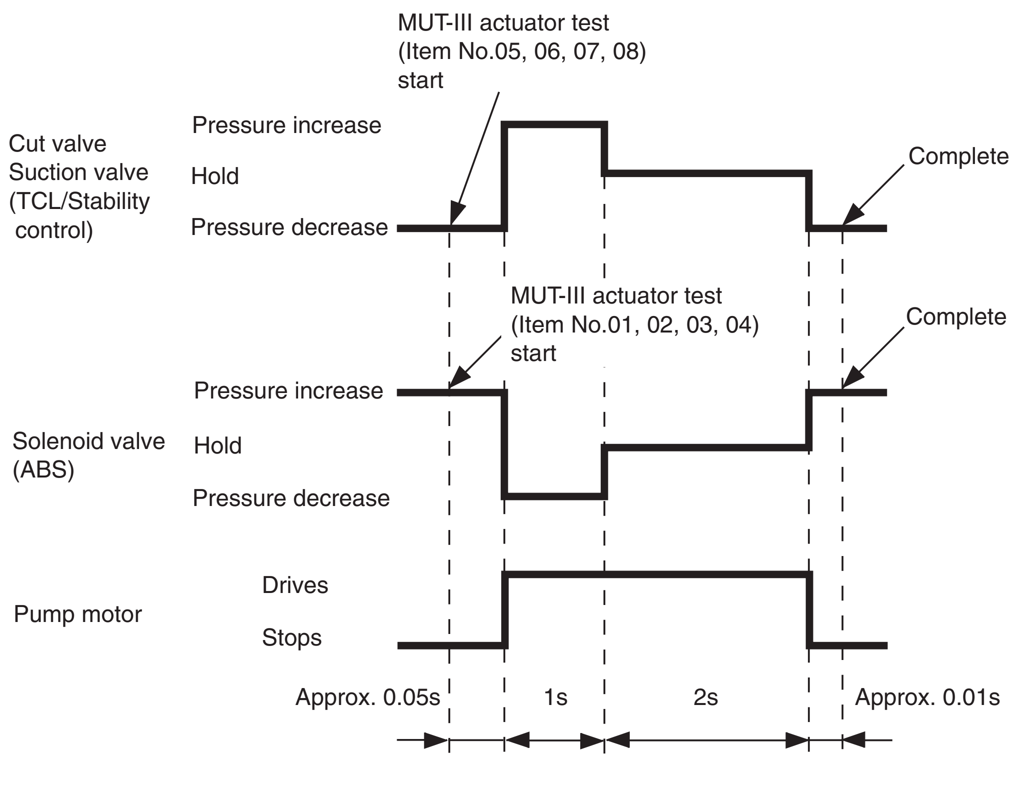
NOTE:
- *The ABS, stability control, and TCL are operated by ASC-ECU.*
- *When ASC-ECU is disabled due to the fail-safe function, the actuator test cannot be performed.*
- *The actuator test can be performed only when the vehicle is stationary.*
- *When communicating with the M.U.T.-III, the brake warning lamp, ABS warning lamp, ASC warning lamp and ASC OFF indicator lamp always illuminate.*

Actuator test specifications

Item No.	Check items	Driven component
01	FR wheel ABS	Solenoid valve for the corresponding channel of the hydraulic unit and pump motor (simplified inspection mode)
02	FL wheel ABS	
03	RR wheel ABS	
04	RL wheel ABS	
05	FR wheel TCL	
06	FL wheel TCL	
07	RR wheel TCL	
08	RL wheel TCL	
09	Engine TCL operation	Outputs the engine torque control signal (engine torque = 0 N·m) to the engine ECU for three seconds.

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Operation pattern of items 01 to 08

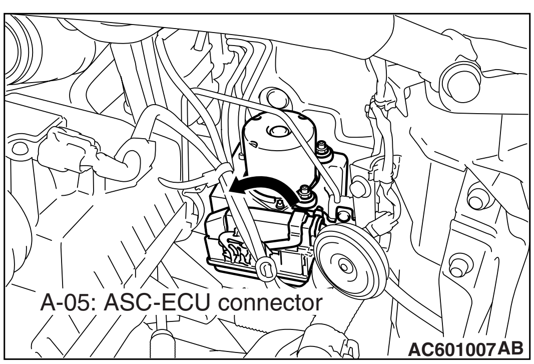


CHECK AT ECU TERMINALS

M1357001400011

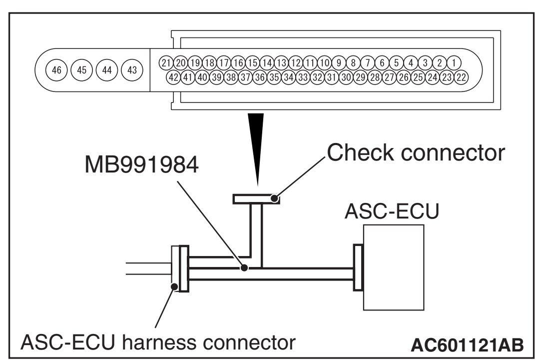
TERMINAL VOLTAGE CHECK

1. Operate the lock lever to disconnect the ASC-ECU harness connector as shown in the figure.



2. Connect the ABS check harness (Special tool: MB991984) to measure the voltages between each check connector terminal and earth terminal (No. 43 or 46).

NOTE: When the ignition switch is turned to "ON," ASC-ECU performs the initial check for approx. 3 seconds. Do not measure the terminal voltage during that period.



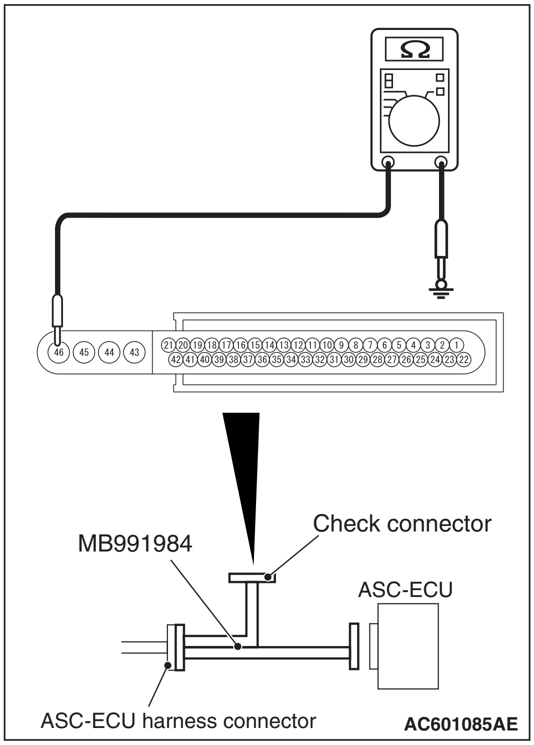
3. Terminal layout is shown in the figure.

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Terminal No.	Check items	Check conditions	Normal condition
6	Stop lamp switch input	Brake switch: OFF (Release the brake pedal.)	Approximately 0 V
		Brake switch: ON (Depress the brake pedal.)	System voltage
8	Wheel speed sensor (RR) input	Ignition switch: ON	0.4 to 1.3 V
10	Wheel speed sensor (RL) input	Ignition switch: ON	0.4 to 1.3 V
11	Wheel speed sensor (RL) power supply	Ignition switch: ON	Voltage that is approx. 0.7 V lower than the ASC-ECU power supply voltage
13	Wheel speed sensor (FL) input	Ignition switch: ON	0.4 to 1.3 V
23	Brake switch input	Brake switch: ON (Release the brake pedal.)	Approx. 0 V
		Brake switch: OFF (Depress the brake pedal.)	System voltage
27	Parking brake switch input	Parking brake switch: ON	System voltage
		Parking brake switch: OFF	Approx. 0 V
28	Wheel speed sensor (FR) input	Ignition switch: ON	0.4 to 1.3 V
29	Wheel speed sensor (FR) power supply	Ignition switch: ON	Voltage that is approx. 0.7 V lower than the ASC-ECU power supply voltage
30	Wheel speed sensor (RR) power supply	Ignition switch: ON	Voltage that is approx. 0.7 V lower than the ASC-ECU power supply voltage
32	Brake fluid level switch input	Brake fluid level switch: ON	Approx. 0 V
		Brake fluid level switch: OFF	System voltage
34	Wheel speed sensor (FL) power supply	Ignition switch: ON	Voltage that is approx. 0.7 V lower than the ASC-ECU power supply voltage
40	ASC-ECU power supply	Ignition switch: ON	System voltage
43	ASC-ECU earth, solenoid valve earth	Always	0 V
44	Solenoid valve power supply (fusible link No. 5)	Always	System voltage
45	Motor power supply (fusible link No. 3)	Always	System voltage
46	Motor earth	Always	0 V

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Group TOC

CONTINUITY CHECK AT WIRING HARNESS-SIDE CONNECTOR



1. Disconnect the A-05 connector, and connect the ABS check harness (Special tool: MB991984) to the harness-side connector.

   NOTE: Do not connect the ABS check harness (Special tool: MB991984) to the ASC-ECU.
2. Check the continuity between terminals shown in the chart below.
3. Terminal layout is shown in the figure.

Connector terminal number	Signal	Normal condition
43 – body earth	Earth	Continuity exists (2 Ω or less)
46 – body earth	Earth	Continuity exists (2 Ω or less)

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ON-VEHICLE SERVICE

HYDRAULIC UNIT (HU) CHECK

M1357001600015

1. Raise the vehicle using a jack and support the specified points with a rigid rack.

⚠ CAUTION

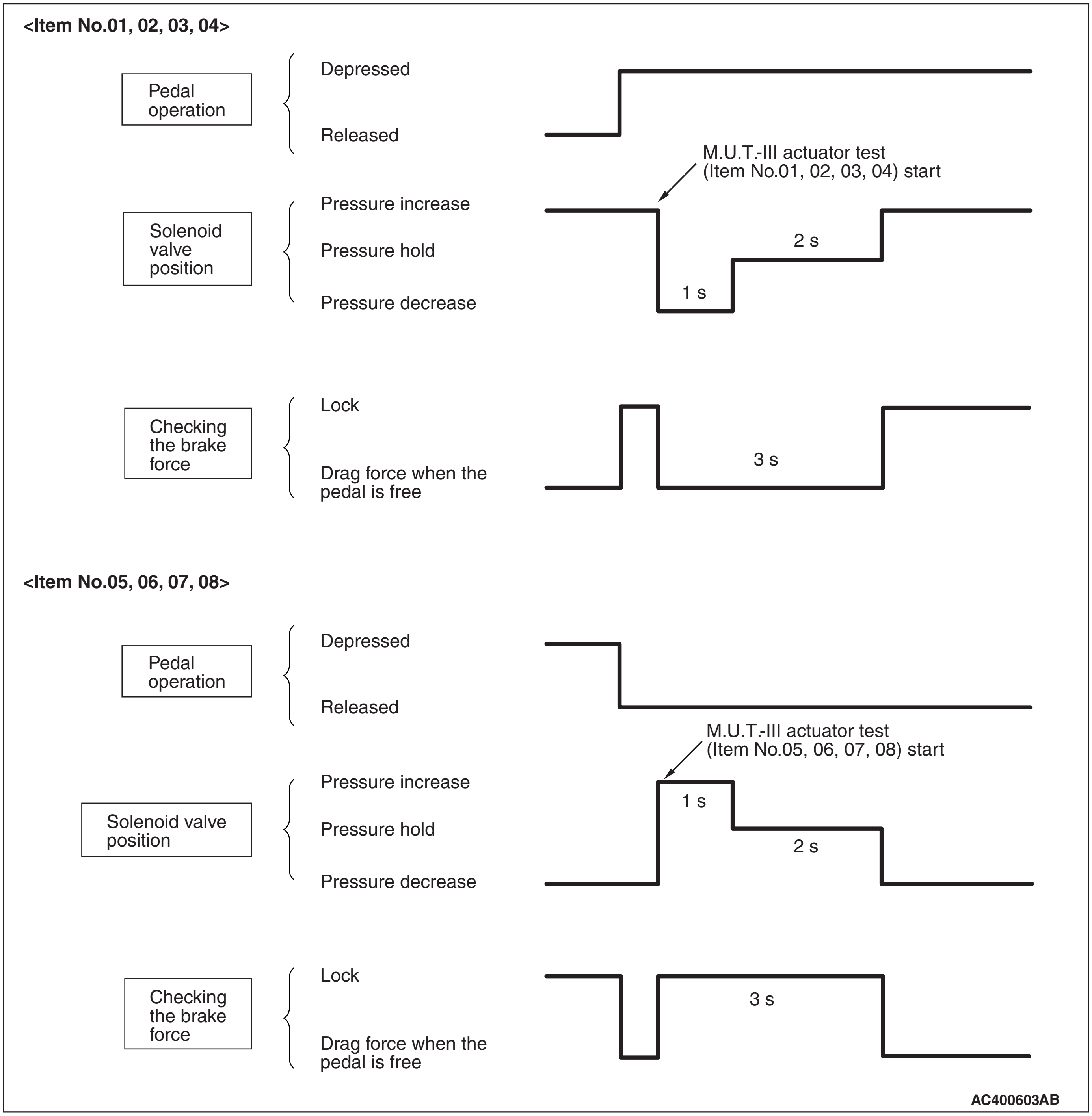
Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Confirm that the shift lever is in the neutral position, and then start the engine.
4. Use the M.U.T.-III to perform the actuator test with depressing the brake pedal. When carrying out the actuator tests, rotate the wheel by hands to confirm that the braking force changes.

   NOTE: During the actuator test, the brake warning lamp, ABS warning lamp and ASC indicator lamp illuminate and the ABS/ASC control is prohibited

   NOTE: When ASC-ECU is disabled due to the fail-safe function, the M.U.T.-III actuator test cannot be performed.

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5. This is indicated as shown in the above.
6. When any malfunction has been found, take a necessary action according to the "Judgment Table."

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Judgment Table

Display on M.U.T.-III	Operation	Test results	Judgment	Cause	Measures
01 FR wheel ABS 02 FL wheel ABS 03 RR wheel ABS 04 RL wheel ABS	• Depress the brake pedal to lock the vehicle. • Select the vehicle to be inspected using M.U.T.-III, perform the actuator test. • Rotate the selected wheel by hands to confirm the braking force.	Braking force decreases for 3 seconds from the lock status.	Normal	–	–
		The wheel does not lock even if the brake pedal is depressed.	Error	Clogged brake line other than hydraulic unit	Check and clean the brake line.
				Clogged hydraulic circuit in the hydraulic unit	Replace the hydraulic unit assembly.
		Braking force does not decrease.		Faulty routing of hydraulic unit brake tube	Route the brake tube correctly.
				Malfunction of hydraulic unit solenoid valve operation	Replace the hydraulic unit assembly.
05 FR wheel TCL 06 FL wheel TCL 07 RR wheel TCL 08 RL wheel TCL	• Select the vehicle to be inspected using M.U.T.-III, perform the actuator test. • Rotate the selected wheel by hands to confirm the braking force.	Lock condition occurs for 3 seconds from the status without braking force.	Normal	–	–
		The wheel does not lock.	Error	• Faulty routing of hydraulic unit brake tube • Clogged brake line other than hydraulic unit	Check and clean the brake line.
				Clogged hydraulic circuit in the hydraulic unit	Replace the hydraulic unit assembly.

7. After the inspection, turn the ignition switch to the LOCK (OFF) position, and then disconnect M.U.T.-III.

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MEASURES FOR DISCHARGED BATTERY

M1357001700012

When starting the engine using a booster cable with the battery fully discharged, if you begin driving the vehicle before the battery is fully charged, the engine misfire may occur and you cannot start the vehicle. This is because ABS/ASC consumes more electric current to perform the self-check. In this case, charge the battery fully.

⚠ CAUTION

Because the vehicle posture when applying the brakes becomes unstable, do not leave ABS/ASC disabled (for example, ASC-ECU connector disconnection).

STEERING WHEEL SENSOR NEUTRAL POINT LEARNING

M1357001800019

⚠ CAUTION

On completion of the following operation, make the steering wheel sensor learn the neutral point.

- **Alignment adjustment <Front>**
- **Steering wheel sensor (column switch assembly) replacement, removal, installation**

⚠ CAUTION

If ASC-ECU sets the diagnosis code other than C1394 before calibration, carry out inspection according to each troubleshooting procedure.

1. Park the vehicle on a level surface with tyres and steering wheel positioned in a straight ahead direction.

⚠ CAUTION

Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Ignition switch: ON
4. Select the system from the Menu.
5. On the "System selection" screen, select "ABS/ASC/ASTC" in the system list, and then click the "OK" button.
6. Select "Special function" in the "ABS/ASC/ASTC" field.
7. In the "Special function" filed, select "SAS calibration."
8. Press the "OK" button.
9. The neutral point is learned.
10. Erase the diagnosis code No. C1394 (Steering wheel sensor neutral point not learned).
11. Turn the ignition key to the LOCK (OFF) position, and remove the M.U.T.-III from the vehicle.

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ASC OFF SWITCH

REMOVAL AND INSTALLATION

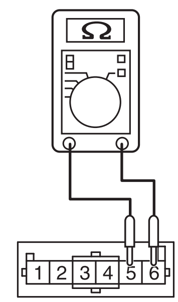
M1357003300010

Refer to GROUP 54A - Fog lamp removal and installation.

INSPECTION

M1357003400017

ASC OFF SWITCH CONTINUITY CHECK



AC601058

1. As shown in the figure, connect the circuit tester to the ASC OFF switch terminals No. 5 and No. 6 as a single unit.
2. If continuity is detected when the ASC OFF switch is pressed and if not detected when the switch is released, the ASC OFF switch is in good condition.

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HYDRAULIC UNIT

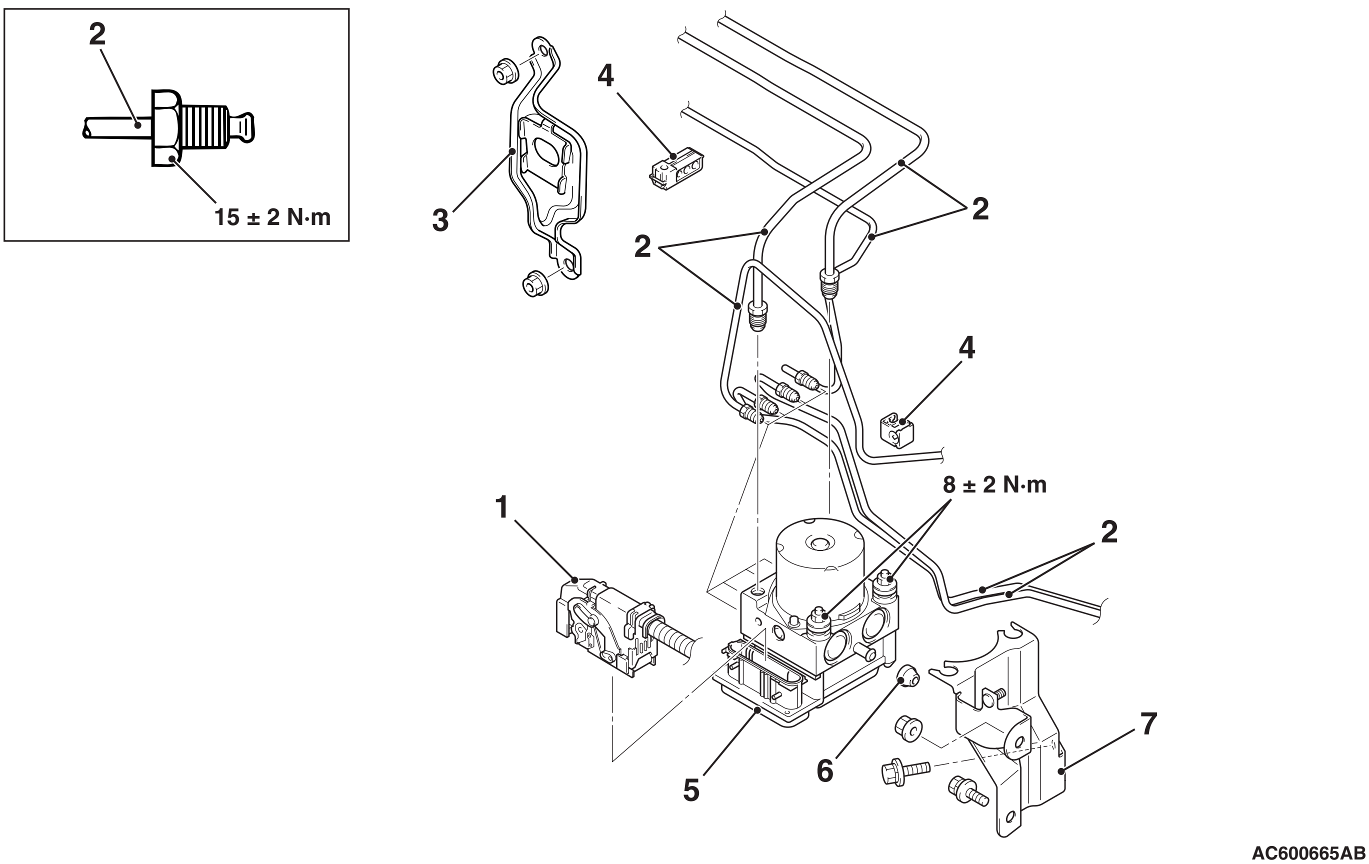
REMOVAL AND INSTALLATION

M1357002000016

⚠ CAUTION

- **Be careful when removing the hydraulic unit because it is heavy.**
- **Never loosen the nuts and the bolts because the hydraulic unit cannot be disassembled.**
- **Do not drop or shock the hydraulic unit.**
- **Do not place the hydraulic unit upside down or transversely.**

Pre-removal operation	Post-installation operation
• Brake fluid draining • Air cleaner body assembly removal (Refer to GROUP 15 – Air Cleaner P.15-6.) • Fuel Vapour Canister Removal (Refer to GROUP 17 – Canister P.17-18.)	• Fuel Vapour Canister Installation (Refer to GROUP 17– Canister P.17-18.) • Air cleaner body assembly installation (Refer to GROUP 15 – Air Cleaner P.15-6.) • Brake fluid refilling and air bleeding (Refer to GROUP 35A – On-vehicle Service, Basic Brake System Bleeding P.35A-10.) • Hydraulic Unit Check (Refer to P.35B-76).



Removal steps

1. ASC-ECU harness connector
2. >>**A**<< Brake tube connection
3. Fuel vapour canister bracket
4. Connection of brake tube and clip

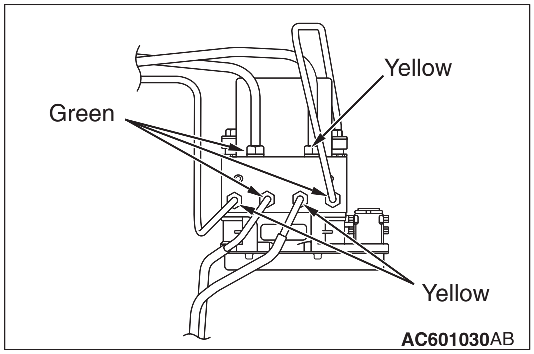
Removal steps (Continued)

5. Hydraulic unit (ASC-ECU)
6. Hydraulic unit bracket insulator
7. Hydraulic unit bracket

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INSTALLATION SERVICE POINTS

>>A<< BRAKE TUBE INSTALLATION



Install each brake tube according to the colour of the flare nut as shown.

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Group TOC

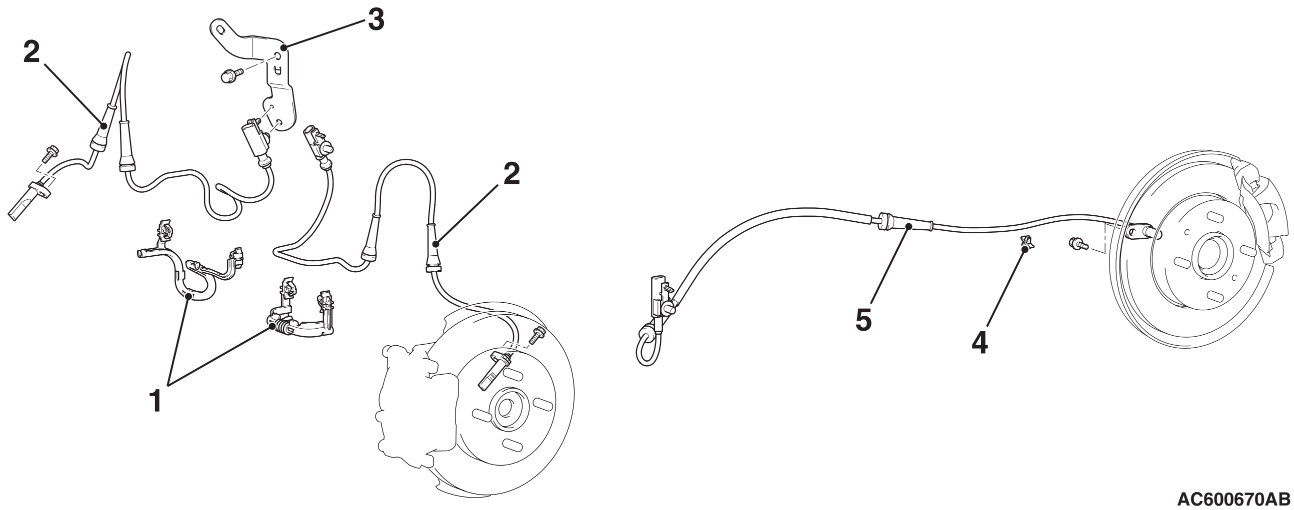
WHEEL SPEED SENSOR

REMOVAL AND INSTALLATION

M1357002200010

⚠ CAUTION

The wheel speed detection magnetic encoder collects metallic particles easily, because it is magnetised. Inspect the wheel speed detection magnetic encoder for foreign material adhesion, and verify that there is no malfunction in the encoder before assembly.



Front wheel speed sensor removal steps

- >>**A**<< 1. Wheel speed sensor protector
- 2. Front wheel speed sensor
- 3. Wheel speed sensor bracket

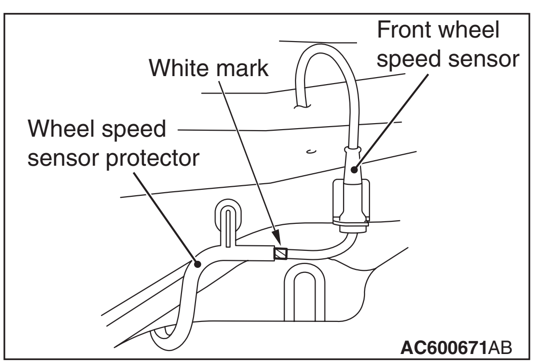
Rear wheel speed sensor removal steps

- 4. Clip
- 5. Rear wheel speed sensor

NOTE:
- *The encoder for detecting front wheel speed is a non-disassemble part integrated with the wheel bearing.*
- *The encoder for detecting rear wheel speed is a non-disassemble part press fitted to the rear hub inner ring.*

INSTALLATION SERVICE POINTS

>>A<< ABS SENSOR PROTECTOR INSTALLATION



Align the end of the white marking of the front wheel speed sensor with the edge of the front wheel speed sensor protector as shown in the figure.

INSPECTION

M1357002300017

Refer to GROUP 35B – Wheel speed sensor.

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Group TOC

G AND YAW LATE SENSOR

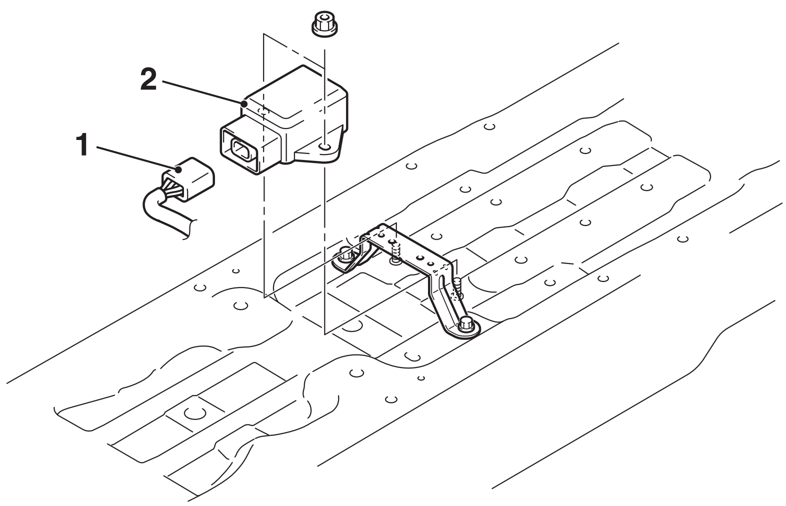
REMOVAL AND INSTALLATION

M1357002500011

⚠ CAUTION

Do not drop or shock the G and yaw rate sensor.

Pre-removal operation	Post-installation operation
• Floor Console Assembly Removal (Refer to GROUP 52A – Floor Console Assembly P.52A-10.)	• Floor Console Assembly Installation (Refer to GROUP 52A – Floor Console Assembly P.52A-10.)



AC600993AB

Removal steps

1. Harness connector
2. G and yaw rate sensor

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STEERING WHEEL SENSOR

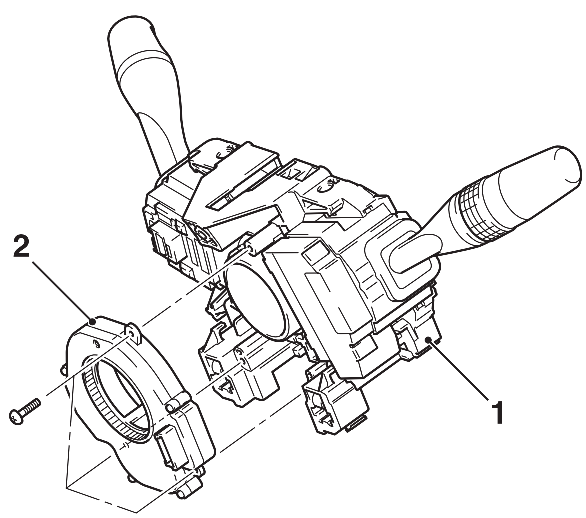
REMOVAL AND INSTALLATION

M1357002800012

⚠ CAUTION

- **When centring the clock spring, always remove the clock spring from the column switch in advance. Otherwise, the sensor may be damaged.**
- **If the centre of the clock spring is not correctly aligned, the steering wheel may not be turned fully or the cable inside the clock spring may be broken, causing the SRS air bag to be inoperative or operated incorrectly.**
- **Before removing the steering wheel/air bag module assembly, refer to GROUP 52B – Service Precautions P.52B-5 and Air Bag Module Clock Spring P.52B-145.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point. (Refer to P.35C-119.)**

Pre-removal operation	**Post-installation operation**
• Air bag module assembly and steering wheel assembly removal (Refer to GROUP 37 – Steering Wheel P.37-90.)	• Airbag module assembly and steering wheel assembly installation (Refer to GROUP 37 – Steering Wheel P.37-90.) • Perform steering wheel calibration. (Refer to P.35C-119.)



AC511706AB

Removal steps

- Position the front wheels in a straight ahead direction.

Removal steps (Continued)

1. Clock spring/column switch assembly (Refer to GROUP 52B – SRS Control Unit P.52B-143.)
2. Steering wheel sensor